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THE AMERICAN TELEPHONE JOURNAL

PUBLISHED EVERY SATURDAY
TELEPHONY PUBLISHING COMPANY
VOL. 74 NO. 4.

CHICAGO, JANUARY 26, 1918.

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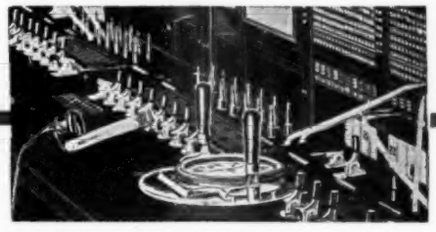

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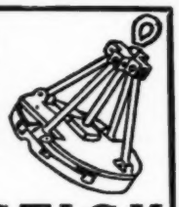

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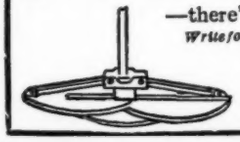

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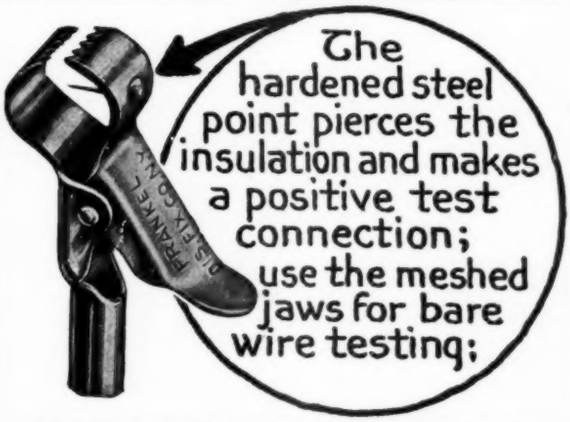
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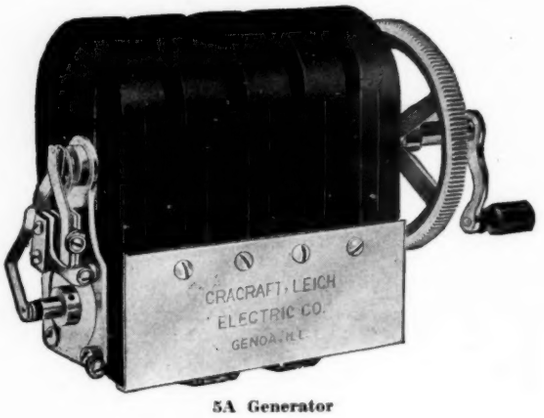

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Telephony.

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Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone, Sound Waves.

PUBLISHED WEEKLY BY THE TELEPHONY PUBLISHING COMPANY
MONADNOCK BLOCK, CHICAGO

J. C. KELSEY, PRESIDENT AND EDITOR.
S. R. EDWARDS, MANAGING EDITOR.

H. D. FARGO, SECRETARY AND TREASURER.
J. R. HASTIE, VICE-PRESIDENT AND ADVERTISING MANAGER.

Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1897.

Volume 74
Number 4

CHICAGO, SATURDAY, JANUARY 26, 1918

Subscription—10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

By the Way—

On coal-less Monday there was more or less thoughtless grumbling over the lack of heat.

The chances are, however, a summary shutdown on telephone service—even for patriotic reasons—would have evoked a deeper and wider protest.

A Chicago business man sat in his office Monday with an ulster pulled up about his ears, and gloves on, and transacted important business over the wire. "Thank God, the telephone isn't run by steam!" he exclaimed.

"Heatless" Mondays.

Last week the great topic of discussion throughout the country east of the Mississippi River was the drastic order of the fuel administration. As applied to public utilities, there was some decrease in the service which they supplied.

The electric light and power companies, of course, had a greatly lessened load, for many manufacturing plants and offices were closed. The steam and electric railroads, so far as the transportation of passengers was concerned, adhered as closely as possible to their Sunday schedules on the heatless Monday.

Telephone exchanges held themselves ready to furnish whatever service was demanded, for they were unable to isolate those subscribers engaged in the exempted occupations from those coming under the fuel order. Service had to be provided for those who demanded it, for it was impossible to make distinctions as to the purposes of the call. The business departments of telephone companies were open only for short periods on the heatless Monday.

Public utilities, including telephone companies, are specifically mentioned in the fuel order as among those preferred industries to which coal is to be supplied.

The order relative to the five-day shutdown of manufacturing plants affected the telephone manufacturing establishments but will not interfere to any serious extent with the manufacture of equipment.

A Change of Attitude.

The latter part of last week it was interesting to read the editorial comments in the various newspapers relative to the order of Fuel Administrator Garfield. It seemed to be the consensus of opinion that the order was issued more as a bit of camouflage than as a direct result of the coal situation.

Throughout the entire order reference is made not to a shortage of coal, but to the inadequacy of the transportation system of the country. Transportation, it appears, was the real cause for the five-day shut down of industry and the subsequent "heatless" Mondays.

The newspapers attributed the cause of the inadequacy of the railroads to handle the traffic situation not to the management of the railroads but to the Interstate Commerce Commission. One newspaper expressed this opinion:

"Because the country declined to permit the railroads to provide themselves with adequate facilities, which mean a stimulation of production at coal mines as well, the country is now short of a vital necessity. There are causes and causes, and every effect is a complex of causes. But back of these causes immediately antecedent to the terrific consequence the nation now confronts is the efficient cause of it all—a continued refusal to deal wisely with the nation's transportation problem."

These quotations illustrate the change of attitude of the newspapers and the public from that of a few years ago, but it really took a critical situation to bring the truth home to the public. As never before, the public is being convinced that an error was made in refusing to allow the railroads increases in rates in the last few years in response to their repeated requests.

In the future it will listen more sympathetically to the requests of public utilities for increases in rates, for it realizes that breakdowns in the service of public utilities are not only possible but probable.

Many telephone companies are approaching a crisis where a policy of retrenchment has prevented provision for the maintenance and installation of proper facilities for service to keep them abreast of the times. Increased rates are essential and the companies have an excellent argument to present to the public by pointing out the conditions which have been brought about primarily through refusal to listen to the plea of the railroads for higher rates.

Directory Copyright Camouflage

Astonishing Claims Regarding Directory Publication Rights Made by Teague Directory & Calendar Co. in Circular Letter—Letters Should Be Ignored as Teague Copyright Cannot Interfere with the Publication of Directories

The latter part of last week TELEPHONY received from telephone companies in a number of states, a circular letter sent out by Charles Crenshaw, an attorney of Sherman, Texas. This letter, which is reproduced on this page, is evidently intended to bluff managers of telephone companies into paying him for the privilege of issuing their own directories.

The Teague Directory & Calendar Co., which Mr. Crenshaw represents, claims to have the exclusive right to publish in every city, town and village in the United States the numerical, alphabetical and classified telephone directory—a most astounding contention.

Form letters sent out by Mr. Crenshaw disclose a great lack of knowledge in the operation of the copyright law. Copyrights can only be secured on subject matter and not upon form. Neither can copyrights be obtained upon tables of data which may be readily secured or worked out from sources independent of the publication which is purported to be copyrighted.

Telephone companies should ignore this communication from Mr. Crenshaw. They should go very slow in in any way seeming to acknowledge the Teague Directory & Calendar Co.'s right to control the issuance of directories.

F. B. MacKinnon, of Washington, D. C., vice-president of the United States Independent Telephone Association, has investigated the particular copyright which is referred to in the Crenshaw letter. He finds that it covered a telephone directory issued for the telephone company at Sherman, Texas, but so far as he could see there is nothing subject to copyright about the directory.

Under the law a form in which matter is compiled or printed, is not subject to copyright and certainly telephone numbers, subscribers' names and addresses are not subject to copyright. This would leave nothing but some statements that might be made in connection with the instructions to subscribers and Mr. MacKinnon doubts very much that such matter is subject to copyright.

Mr. MacKinnon is endeavoring to run the matter down and take legal steps to prevent the further issuance of such letters. E. C. Blomeyer, of Waco, secretary of the Texas Independent Telephone Association, has taken the matter up and is advising the Texas telephone companies to disregard the letter sent out by Crenshaw.

C. A. Shock, general manager of the Grayson Telephone Co., Sherman, Texas, states that the Teague company claims a copyright of all telephone companies. Mr. Shock's construction of the law, however, permits a telephone company to print its own directory from its own original source of information. Mr. Shock's new directory went to press this week notwithstanding threats of suits from Crenshaw.

Notices have been mailed by Crenshaw to the subscribers of Mr. Shock's company stating that it is a violation of the law for them to permit their names to appear in the company's directory. No one, however, takes him at all seriously.

Crenshaw's letters should be ignored by all telephone companies. If he has violated the postal laws, the government officials will take care of him as they have had the matter referred to them.

DAMAGE SUITS AND COLLECTIONS A SPECIALTY

CHAS. CRENSHAW
ATTORNEY AT LAW

NOTARY PUBLIC FOR GRAYSON COUNTY

Mgr. Telephone Co.
Cairo, Ill.

Sherman Texas, Jan. 1918

My Dear Sir:

I beg to advise you that The Teague Directory & Calendar Co , copyrighted on December 3, 1917, in Entry class A XXC No 480365 This copyright was duly issued by the Department at Washington, D C., and in doing so under the law, gave to The Teague Directory & Calendar Company the exclusive right, not only to your city, but to every other city, town and village in the United States of America the right to publish telephone exchange's numerical and alphabetical directory And if this right is violated under the laws of the United States, then each telephone company located in each city, town or village wherever located within the United States, will be guilty of the infrigement of the copyright secured by The Teague Directory & Calendar Company. And the information heretofore given to you was intended to advise you of this fact, and that for a violation of their right under this copyright, that each telephone company located in each city, town and village would be proceeded against for damages under the United States law; and in order to save this kind of litigation and controversies, the information aforesaid was given to you for the purpose of enabling you, if you desired to do so, to enter into contract upon reasonable basis for the right to publish your directory in your respective cities, towns and villages upon a reasonable basis, without a violation of the United States Statutes

Now what we desire to know is, whether or not you desire to enter into a contract with the Teague Directory & Calender Company upon a reasonable basis, paying the cash for the right to publish your directory for your respective telephones in your respective cities. towns and villages in your territory

The legal right of The Teague Director & Calendar Company under their copyright covers not only all standard or customery forms of directory. but includes them with the improvements secured in this copyright by The Teague Directory & Calendar Company; that is, with alphabetical lists of your subscribers in the respective cities, towns and villages in your territory, with the number of the subscriber's telephone opposite or by his name.

This letter is specific to you, with the desire on our part that this right may be granted to you upon reasonable and fair terms, without litigation.

Will you kindly advise us by return mail whether or not you desire to enter into a contract, and our price to you for your respective cities, towns aud villages in your territory, and then we will take it up with you in a business way and adjust it on a fair and reasonable basis if you desire, and oblige,

Yours very truly
THE TEAGUE DIRECTORY & CALENDAR CO.
BY, *CHAS. CRENSHAW* Att'y

Letter Which Shows Great Lack of Knowledge in Operation of Copyright Law.

Butler (Ga.) Telephone Co., Changes Ownership.

The entire interests in the Butler Telephone Co., of Butler, Ga., have been transferred by J. W. Musselwhite to R. W. West and others. The new owners have employed E. A. Childers as local manager.

We Should Be Members of U.S.I.T.A.

Character of Telephone Service and Rapid Growth Necessitate Large Number of Companies—Great Number of Questions to Be Solved and Some One Organization, the National, Should Lead in Solutions

By O. F. Berry

The telephone is one among the great inventions of recent times—in many respects, the most practical and useful. It is now a necessity in every business house and a great need, at least, in every residence.

The vast amount of business of our country today could not be transacted without the telephone. If messenger boys, or the individual members of firms, in the city of Chicago were compelled to go from office to office with messages that are now passed over the telephone wires, the congestion on the streets would be so great that it would be practically impossible to conduct the business of the city.

The very character of telephone service, its rapid growth, has necessitated the organization of a very large number of telephone companies and associations, ranging from the small rural line in the country, operated by a small number of farmers, to the larger exchanges in the various cities. The further fact is that the building of telephone lines and the operating of exchanges came so rapidly that much of the work in the beginning was poorly done, and the operating was performed at a loss, and that is true with a great many companies even today.

The fact is that the public is not even now advised of the real cost of building or operating telephone systems. A further fact is that in order to render the best service, there should be a connection for the purpose of traffic between all telephone lines.

Many complications must be solved from time to time. The object of all persons interested in the telephone business should be one system, properly regulated, or if more than one system, proper physical connections upon a proper operating basis with each other.

The tendency of today, both among telephone men and utility commissions, throughout the country is to do away, so far as possible, with duplication of investment, and to require a higher standard of both equipment and service.

The great necessity for telephone service in the rural districts of the country presents another equally difficult problem, which must sooner or later be adjusted.

In view of the large number of small units or organizations in the telephone business, the large number of questions for solution, and the new and difficult problems to solve, make it necessary that some one organization should lead in the solution of these problems. Therefore in this as in any other great business, there should be a national organization, for the reason that the telephone business is a national business—for the further reason that no one company, or even a small unit of companies, can make the proper investigations and procure the necessary information to assist properly in the solving of these questions.

The matter of physical connection, the matter of the character of the equipment, the rates to be charged, the duplication of property are all questions that should in their very nature be handled by either a national or a state organization. Our

O. F. Berry.

whole system of government is based on a national government for the purpose of directing the general interests of the entire people, with separate states, with certain rights for the protection and government of people in that particular state.

The government could not exist or operate properly without the assistance of the state. The state would be of much less value to its citizens if it were not for the assistance and care of the national government. The same truth may be carried over into the telephone business, which touches almost every citizen, and is used in almost every business. The questions of great interest should be solved by a national organization, possibly assisted by a state organization, and the state organization through its smaller units, if we are to expect a continuous growth in improvement both in service and returns.

The national organization should be composed of just as many of the units as possible—the greater the number, the greater the interest, and the more valuable the service rendered. The management of the national association should be broad and liberal, taking into consideration the whole people, and the whole business, the necessity for service, the protection of property, and the entire growth of the telephone business throughout the whole country.

Such an organization can be of great value not only to the telephone business, but to the country at large. With this end in view, I believe it would be a great benefit to telephone interests if all companies should become members of the national association. Every company or association engaged in the telephone business, if it will take a proper interest in both its state and national organizations, will receive more benefit by far than the expense of joining or belonging to such organization.

The greatest need today of the telephone business is more personal, intelligent interest in the business by the persons engaged therein, and also broader and more complete course of education from the national and state organizations to the people who are using telephone service.

I am therefore sincerely of the belief that great benefit would come to the business if practically all of the Independent telephone companies throughout the country would join the national association, and assist it in every way possible, together with their state organization, to protect in every proper way their several interests, and thus enlarge the business in which so many of us are engaged.

Conditions are such now that it will take the best thought we can furnish, as well as industry and economy, to carry us through, therefore let us help each other in every way.

Crestline (Ohio) Company Holds Its Annual Meeting.

The Crestline Local Telephone Co. held its annual meeting recently in Crestline, Ohio, and elected the following directors for the ensuing year: Jacob Babst, A. H. Kinsey, J. F. Markel, of Crestline; J. A. Wright, Allan Aigler, R. T. Wolfrom, and Frank A. Knapp, of Bellevue. The board organized by electing Jacob Babst, president; Frank A. Knapp, vice-president and general manager; R. T. Wolfrom, secretary; and A. H. Kinsey, treasurer.

Reis Telephone and Nature of Sound

Discussion of the "Break and Make" Theory of the Reis Telephone in Regard to Its Relation to Nature of Sound—Structure of Reis Telephone, Its Intended Action and Its Occasional Action—Not a Practical Instrument

By Arthur Bessey Smith

One of our valued subscribers has, through the medium of a query, opened a subject which we believe will be of enough general interest to merit a full treatment instead of a short answer. The letter is as follows:

"It is an accepted fact that while the talking electric current primary circuit of an induction coil is of undulating character, the induced current in the secondary is alternating, that is, it rises to a maximum positive, falls to a zero value, rises to a maximum negative and falls to a zero value again, thus performing a complete cycle, although by no means of the sine form.

Now, the invention of the telephone by Johann Phillip Reis, and subsequent invasion of the same apparatus along different principle by Prof. Alexander Graham Bell, have been the cause of contentions among scientists.

To this date, we still find so many pro's and con's on each side of the two principles that room for discussion still exists. For instance, it is said that the 'break and make' theory of Reis allowed the flow of intermittent current and that, for this reason, it could not reproduce the complex sound waves produced by articulate speech. Yet Prof. Sylvanus P. Thompson, Prof. Dolbear, and Thomas A. Edison, are some of the wonderful scientists who substantially admitted the Reis's telephone will transmit speech and respond to all the characteristics of the voice very distinctly.

Reverting to the main subject, I will ask and appreciate a practical and convincing answer to these questions:

Does or does not, the 'open,' or break interval, of Reis's transmitter correspond to the 'zero,' or no current, interval of the talking current in the secondary circuit of the induction coil?

Have not these 'open' and 'zero' intervals the same effect upon the characteristics of speech current? If so, is it not apparent that the introduction of the induction coil in the telephone circuit proves that Reis, Thompson, Dolbear, Edison and others did hold to an efficient principle and that, indeed, Reis invented a practical and satisfactory telephone?

I do not commit myself to either principle, but my mind is open to receive the answers to these questions, as I said before, in a practical and convincing manner."

The facts concerned in the treatment of the subject raised are: The nature of sound, the nature of any movement transmitting sound, the structure of the Reis telephone, its intended action, and its occasional action.

Sound is a vibration, simple or complex. If the sound be transmitted through air, each air particle concerned moves forward and back rather rapidly. At any one point the air pressure rises and falls with the same rapidity as the particles move to and fro.

If the sound be a simple tone, pure, without color, the particles move according to the law of sines. The pressure at any place rises and falls also according to the sine law. The movement of the particle is illustrated in Fig. 1-*A*.

At zero time, we may imagine the particle to be at a certain place (zero). A little later it has moved forward a distance, *d*. Then it moves back to its initial place (zero) only to keep on going without stopping until it reaches a distance, *d*, behind the initial place, after which it starts forward again.

It vibrates forward and back in a straight line over the same path 2 *d* long. Its position at any time is proportional to the sine of 6.28xfrequency. The variation of pressure (Fig. 1-*B*) follows the same law, rising and falling above and below the average pressure indicated by the dotted line.

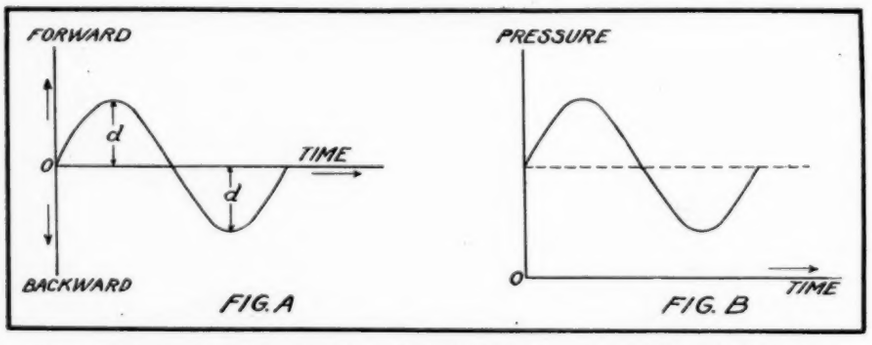


Fig. 1. Movement of Air Particle and Variation of Pressure Follow the Sine Law.

All complex sounds are composed of several vibrations, each having its own frequency different from the others. These frequencies may have any relation to each other, as for instance, 521, 643, 1,008, and 1,594 cycles per second. These blended, will result in a sound of a certain character.

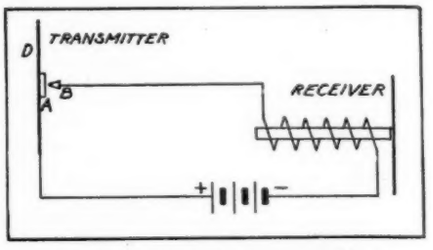


Fig. 2. The Reis Transmitter.

Any medium transmitting sound must act according to the same law. Air has been described as moving to and fro, and rising and falling in pressure. If it be a diaphragm, it must bend forth and back. If it be electricity, it must rise and fall in strength. All these variations, whether of position, pressure, or current strength must be *continuous*.

The transmitting medium, air, or diaphragm, or electricity, obeys each frequency as if that frequency were alone, though the total sound is a blending of all the frequencies occurring simultaneously. This being the case, we can consider the action of one frequency at a time, this frequency being a simple harmonic sine wave or motion.

In the medium transmitting sound, there is no period of "no motion" or "no current." When the particle is at the extreme end of its travel, it reverses the direction of its motion, but is not quiet for any time.

The Reis transmitter, Fig 2, was essentially a diaphragm, *D*, carrying a contact, *A*, with a stationary contact, *B*, behind it. It was the object of Reis, stated by himself, to have the diaphragm *make and break* between *A* and *B* when the diaphragm vibrated in response to sound. This object was fully secured.

When a simple, pure sound (one frequency alone) acted on the diaphragm, it made the latter move back and forth as the pressure of air increased and de-

creased. This is a continuous motion, similar to the motion of an air particle as described in connection with Fig. 1-*A*.

When the diaphragm moves backward, there is no current flow until the two contacts, *A* and *B*, touch each other. Then the current rises as rapidly as the properties of the circuit will permit, with no relation to the nature of the sound which caused the motion of the diaphragm.

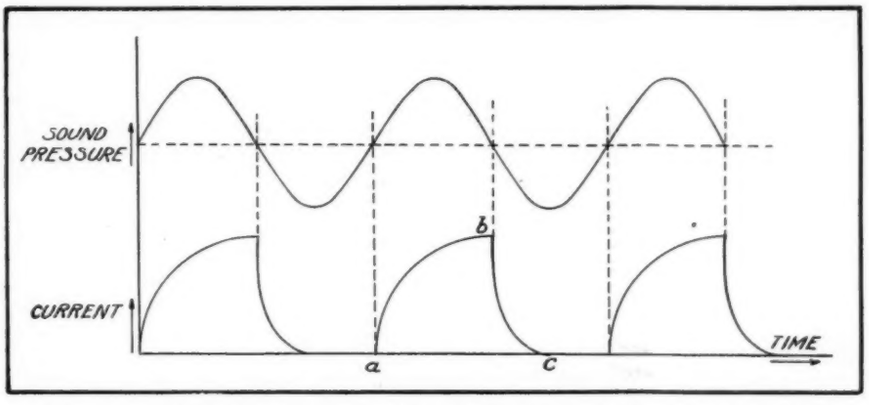


Fig. 3. Approximate Nature of Current Pulsations of the Reis Transmitter.

When the diaphragm moves forward, the contact breaks and the current falls as rapidly as the conditions permit, with no regard to the nature of the sound which caused the motion. The approximate nature of the current pulsations thus produced is shown in Fig. 3. At the top is plotted the sine wave representing the variations in air pressure caused by the sound. Below is platted the current flow in the wire caused by the action of the sound on the diaphragm. The rise of current from *a* to *b*, results from the closure of the contact when the diaphragm has advanced far enough. The fall of current from *b* to *c* results from the opening of the circuit when the diaphragm recedes enough.

The unlikeness of the current wave produced by the Reis telephone to the simple tone which produced it, is apparent. It will have the same pitch, but will differ totally in quality. The shape of the current wave is absolutely different from the shape of the sound wave.

No matter what may be the combination of simple tones in a complex sound, the Reis transmitter, operating as Reis intended, can not reproduce the wave shape correctly. It can reproduce the pitch, but not the quality of the sound.

In order to reproduce several frequencies at once, the current of electricity must be caused to increase and decrease *continuously* in exactly the same manner as does the sound wave in air. Because of the discontinuous nature of the pulsations caused by the Reis transmitter, it does not give a current wave which is like the sound wave. This is illustrated by the compound curve *A* in Fig. 4.

At a glance it is seen that it is *not* a simple, pure tone of one frequency. It is composed of a fundamental tone, curve *B*, with which is mixed a tone, curve *C*, whose frequency of 6⅓ times and its amplitude one-fifth that of the fundamental.

The combined sound, *A*, sounds different from the sound of the fundamental *B*, alone. Yet the Reis transmitter in its normal state has no means by which it can convert these ripples of the compound wave into the same kind of an electrical wave.

It is acknowledged that occasionally the Reis transmitter would speak. It is just as certain that it could not be depended upon to speak and that Reis did not know how to get it to speak. If by any chance the contacts in the Reis transmitter were adjusted so as never to break the circuit, but merely to vary the resistance when the diaphragm vibrated, the apparatus would talk feebly.

It is possible that Reis might sometimes have secured a microscopic arc, and by variations in its length, caused speech reproduction, though this seems to me very improbable. If this transmitter ever spoke, it did it by gradual variations in the circuit and never by entirely making and breaking it.

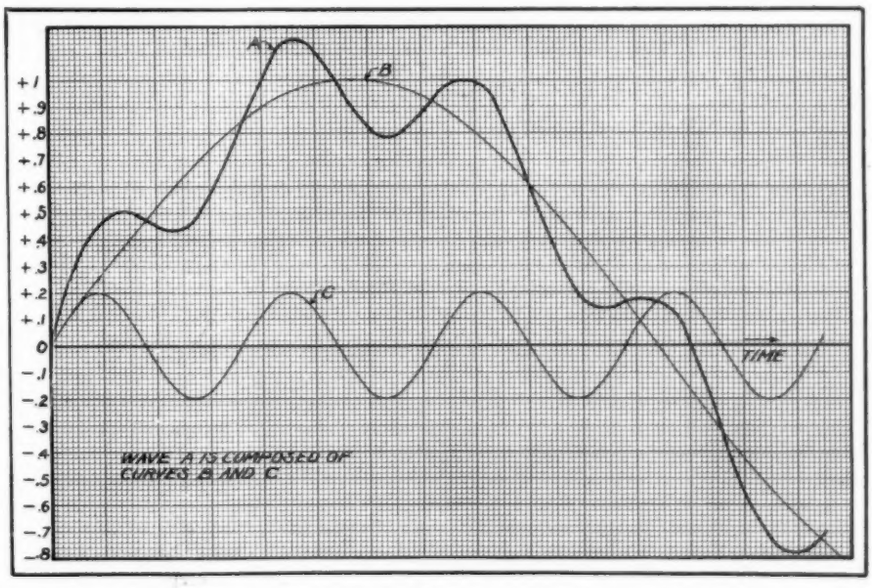


Fig. 4. Illustration of Difference of Current Wave of Reis Transmitter from Sound Wave.

There is no "zero" or "no current" interval in the talking current flowing in the secondary circuit of the induction coil of a local battery telephone. This current is alternating, and as such passes through zero values many times per second. But the current does not stay at zero any time at all, it merely passes through zero on its way from positive flow to negative flow, and does it at high speed.

The induction coil is used to separate the alternating current from the direct current in the transmitter circuit, to give it a higher voltage, and to enable the transmitter to work in a circuit of low resistance.

Reis did not invent a practical telephone. To follow his structure would have led the art to certain failure. Bell caught the correct principle, that of continuity. To follow Bell led to success, as attested by the present state of the telephonic art.

Discussion of the Same Query Regarding Reis Telephone.

By J. G. Mitchell.

It is an error to suppose that the secondary current in the telephone circuit rises to its maximum, falls to zero, then rises to its maximum in the opposite direction, and then falls again to zero. As a matter of fact, the voltage variations of the secondary current and the secondary current strength itself, of the telephone induction coil follow no such simple wave form.

The current may rise, then fall *toward* a zero value without nearly reaching zero and then rise again to a still greater value than before. For this reason the make and break transmitter of Philip Reis does not seem to have been suitable for the

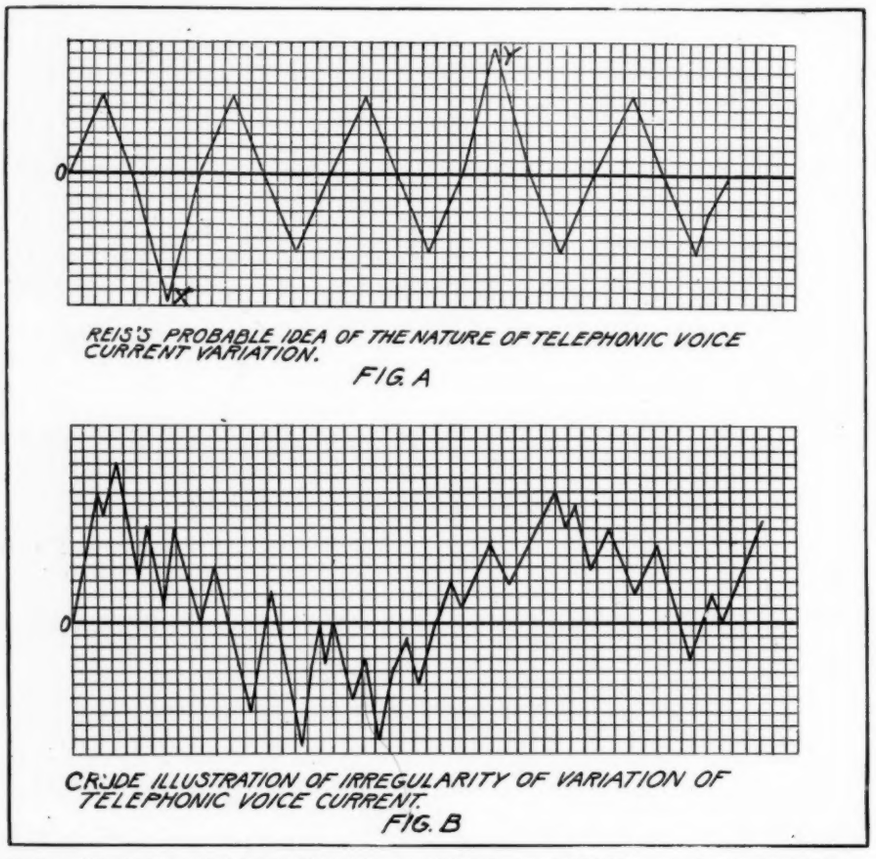
transmission of human speech with its tremendous irregularity of wave form and frequency.

Since Reis did not contemplate the use of anything similar to the present standard receiver but relied for his receiving effect upon the *click* produced in the core of an electromagnet when the current in its coils was *broken*, it is extremely difficult to make any comparison between the work of Reis and that of later inventors.

It seems, however, to have been Reis's idea that the quality of sounds was produced by extra powerful impulses in the direction of the sound waves. These extra powerful impulses may have occured, according to the apparently authentic record of Reis's theory, regularly or irregularly. He accordingly intended, apparently, to affect the hammer contact point of his transmitter more violently by these powerful impulses, and so affect the succession of clicks produced in the core of his electromagnet receiver.

If this was the theory of Reis—and the evidence points strongly that way—we know that he could never have transmitted articulate speech. As a matter of fact the vibrations of the transmitter diaphragm or of the ear drum are complex instead of simple. While one major vibration is taking place, other minor vibrations are also taking place in the diaphragm without affecting the main vibration.

This distinction is shown in the accompanying curves. In Fig. A is shown the theory of Reis as to the nature of the alternating line current required to reproduce articulate speech. The extra powerful impulses are shown at *X* and *Y*.



Curves Illustrating Reis' Probable Idea of Voice-Current Variation and Its Real Nature.

In Fig. B is shown the nature of the wave form that we *know* will reproduce articulate speech. Had Reis made use of the present type of receiver, he would in all probability have been able to work out a modification of his transmitter that would have been effective in the transmission of actual speech.

Mansfield (Ohio) Operators Handle Heavy Traffic Load.

The Mansfield Telephone Co., of Mansfield, Ohio, handled an unusually heavy traffic load the day before Christmas, December 24, 1917, as is shown by the accompanying peg count for the hours from 7 a. m. to 7 p. m. Positions Nos. 1 and 2 handle the farm line telephones and local toll lines, while the remaining 16 positions take care of the traffic on 6,500 city telephones on one, four and eight-party lines.

The peak load varies on the different positions, but the greatest number of calls on all positions combined was put through between the hours of 8 and 9 a. m., the operators handling 5,409 calls. The hour between 6 and 7 p. m. made a close second with 5,121 calls. The total number of calls handled during the entire day was 63,067.

The board over which this load was carried is an American Electric common battery multiple and the greater portion of the equipment has been in service since May, 1902.

	—A. M.—						—P. M.—				
Position	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7
1	86	132	125	121	130	138	145	153	200	90	141	183
2	213	136	112	99	206	140	92	184	48	109	173	186
3	300	441	528	485	461	501	491	398	437	342	347	396
4	225	347	343	393	303	359	224	226	273	335	318	312
5	261	241	184	196	260	231	240	318	281	311	353	314
6	201	282	252	273	331	349	282	226	228	197	333	424
7	248	306	354	308	348	224	273	260	291	157	97	188
8	100	269	226	256	154	219	163	295	299	280	161	216
9	267	333	295	283	347	329	292	261	325	290	329	374
10	241	363	365	271	237	295	354	274	254	183	273	355
11	299	277	255	249	222	232	232	132	165	259	236	305
12	162	264	219	239	117	341	172	253	292	284	277	231
13	245	309	320	265	266	231	272	252	277	236	206	276
14	230	351	316	317	188	421	319	281	304	261	264	417
15	258	367	273	244	102	290	250	312	364	276	210	252
16	248	281	238	211	264	207	198	135	167	171	292	365
17	...	412	19	245	149	205	196	...	70	196	128	139
18	267	298	306	275	158	203	255	271	191	154	212	188
Total	5,851	5,409	4,730	4,730	4,243	4,915	4,450	4,231	4,466	4,131	4,350	5,121
Total for day												63,067

Peg Count of Mansfield (Ohio) Telephone Co. for December 24.

Poles of "Wireless Telephone Company" Sold for Taxes.

A line of poles owned by the Metropolitan Telephone Co., and strung all over Allen county, where the company received the nickname "wireless telephone company," were disposed of recently at a sheriff's sale at Fort Wayne, Ind., in order to satisfy taxes which are due Allen county for the last five years. The total amount received for the poles was $585.

The poles were sold in lots according to the township in which they stood. The poles in Eel River township were bought by W. H. Soest, manager of the Churubusco Telephone Co., at Churubusco, Ind., for $72.67. The Home Telephone & Telegraph Co. of Fort Wayne purchased the poles in Cedar Creek township for $100 and those in Springfield township were bought by the Fort Wayne & Northern Indiana Traction Co.

Extensive Improvements Under Way at Norristown, Pa.

The United Telephone & Telegraph Co. is installing in its Norristown, Pa., plant a new Kellogg switchboard with automatic listening and listening and secret service. The entire system is undergoing rehabilitation under the direction of Manager James O'Hare.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties—Prepared Under the General Supervision of Stanley R. Edwards—This Section, "Part VI, The Valuation of Telephone Properties," Written by Chas. W. McKay

Quiz Questions on the Preceding Installment.

411. Outline a very approximate method of inventorying and appraising the aerial cable plant.

412. Why are not approximate methods adopted for appraising the underground plant? Describe a method for making an appraisal of this part of a telephone plant.

413. How are the main and lateral cables measured?

414. What is block cable? Describe a plan used for inventorying and appraising block cable.

415. What are house cables? Outline approximate methods of inventorying and appraising house cables.

416. Describe a plan for obtaining a rough estimate of the value of the underground plant.

417. What sub-accounts are included in the main account, "Station Equipment"? Outline a short-cut method of appraising subscribers' station equipment.

418. Give a recapitulation of the Interstate Commerce Commission's instructions as to the classification of station apparatus. How may a reasonably accurate appraisement be effected?

419. What does the station installation account include? How may its value be quite accurately determined?

CHAPTER XIX. Appraisals in Rate-Making (Continued).

420. *Interior Block Wires.*—To this account should be charged the cost of interior block wires from the point of entrance to subscribers' premises—where a connection is made with inside wires—to the point of connection with block cable terminals.

The plant included under this account is really a part of the outside distribution system but, for reasons best known to the Interstate Commerce Commission, it has been included in its accounting instructions as a part of the station equipment.

A reasonably accurate appraisement of the block wire equipment may be had by estimating the total numbers of stations located within the blocks cared for by interior block cable systems and applying to this block inventory an average unit cost. This average unit cost may be determined by estimating the average length of block wire per station and making due allowance for the auxiliary equipment, such as bridle rings, long-saut clamps, etc.

421. *Private Branch Exchanges.*—To appraise the private branch exchange equipment by approximate methods, it is only necessary to determine the total number of P. B. X.'s and the most prevalent size and type. Given these data, the method of appraisement will be obvious.

422. *Booths and Special Fittings.*—The accounting instructions of the Interstate Commerce Commission prescribe that the cost of booths and special fittings—such as desks, chairs, fans, cash registers, etc.—together with the cost of installing such equipment, shall be charged to Account No. 235, Booths and Special Fittings.

The appraisement of the equipment falling under this account may be effected by the method suggested in the foregoing paragraph—by determining the total number of installations and a unit cost representative of the average equipment and installation costs.

423. *Central Office Equipment.*—As in the case of the other elements of a telephone company's plant, the method used in appraisement of the central office equipment is dependent largely upon the refinement of detail desired. Other things being equal, it is always best to adhere to the classification of equipment prescribed in the accounting instructions of the Interstate Commerce Commission.

To review briefly the portion of these instructions referring to the central office plant, Account No. 220 (Central Office Equipment) is divided into two sub-accounts, as follows: Central Office Telephone Equipment, Account 221; Other Equipment of Central Offices, Account 222.

424. *Central Office Telephone Equipment.*—This account includes the cost of local and toll switchboards, chief operators', monitors' and supervisors' desks and tables, wire chiefs' testing outfits, main and intermediate frames, central office cabling and wiring. It also includes such auxiliary apparatus as call registers or motors, relay and coil racks, power plants—including rectifiers, generators, motors, batteries, power switchboards, motors and fuse boards—telegraph instruments and telephone substation apparatus when used exclusively as a part of the central office equipment.

A very rough estimate of the reproduction cost of the central office equipment may be had by first determining the general type of equipment—whether magneto, common battery or automatic—the number of stations, and then applying the unit cost per station. Such an estimate of reproduction cost is necessarily extremely broad gauge as it makes no allowance for party line concentration and special multiplying features.

A better way is to determine the ultimate capacity of the board in lines and its present equipment in lines and then work out a unit cost per line equipped. In deriving such a unit cost, the capacity feature may be taken into consideration and due allowance made for auxiliary equipment, such as main and intermediate frames, power plant, etc.

In deriving a unit cost such as the foregoing, consideration will first be given to the general type of switchboard, whether magneto or common battery. Next, the type and make of board will be investigated. For instance, a certain unit cost per line, with slight modifications, is applicable to all Western Electric Company No. 10 boards. Another unit cost may be found for Kellogg common battery boards, etc. If the equipment under appraisement is of the automatic type, a unit cost per Keith unit may be applied or, as in the case of the manual switchboard, a unit cost per line.

425. *Unit Costs of Appraisal Engineers.*—In considering this subject of short-cut methods of appraising central office equipment, the reader must not gain the impression that appraisal engineers have in their possession certain definite unit costs, worked out on a cost per line basis, that may be used indiscriminately in all cases. As a matter of fact, the appraisal engineer will probably have certain guiding figures in mind and, when confronted with a specific problem involving an appraisement by short-cut methods, he will use these figures only as a general guide.

The unit cost to be used in the case in hand will in all probability be the subject of a good deal of thought, even if only an approximate valuation is desired. In other words, the appraisal engineer will size up the individual peculiarities of the office equipment under consideration and the unit cost finally used will be the result of many trial computations. Among other things, the appraisal engineer will bear in mind freight and in-

stallation costs, the amount of multiple, if the board be of the manual common battery type and the general nature of the power plant equipment.

If the plant under appraisement is a comparatively new one, which is rarely the case, it may be possible to determine an extremely accurate reproduction cost by first ascertaining the actual cost of the central office equipment as shown by the company's books or the manufacturers' records, and subsequently making due allowance for changes in the material and labor markets between the time the board is installed and the time of appraisal.

426. *Other Equipment of Central Offices.*—This account, it will be remembered, includes all of the auxiliary central office equipment—other than what may properly be classified under the heading of "Telephone Central Office Equipment." Desks, chairs and all other office furniture used exclusively by the operating forces will fall under the category of "Other Equipment of Central Offices." To this account may also be charged equipment used in operators' rest, retiring and lunch rooms.

The equipment falling under Account 222 may, if desired, be appraised on a cost per line basis. Usually the reproduction cost of this miscellaneous equipment bears a more or less fixed ratio to the cost of the central office equipment proper. However, in most central offices the amount of this auxiliary and miscellaneous equipment is so small that it is really quicker, and certainly more accurate, to take a rapid inventory and appraise this inventory at prevalent market prices for the material involved.

427. *Omissions, Purchasing Expense, and Tool Expense.*—All of these items may be evaluated by approximate methods—by determining their ratio to the cost of the inventoriable property. The following ratios—expressed in per cent of reproduction cost of inventoriable property—will be found conservative:

Item.	Percentage.
Omissions and contingencies	2 to 5
Warehouse and purchasing expense	2 to 6
Tools and tool expense	2 to 5
Total	6 to 16

(*To be continued.*)

Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Independents to Take Over Bell Plant in Blair, Neb.

The stockholders of the Blair (Neb.) Telephone Co. have voted approval of a proposition to amend their articles of incorporation so as to provide for $100 shares of stock instead of $40, as at present. This is equivalent to assessing each of the 260 shareholders $60 a share. With the $15,600 thus raised, it is proposed to purchase the Blair exchange of the Nebraska Telephone Co.

Previous negotiations had, a year ago, failed of reaching any conclusion, but the Bell people have agreed to sell at a price to be determined by arbitration, and this will be accepted. Each company will name a representative and the state engineer will form the third. Under the terms of the agreement either party may sell or buy at the value reached by these engineers.

The home company voted not to sell, and instructed its representatives to proceed upon this understanding. The sentiment of the stockholders was that they preferred to put a little more money in a plant and own the only one in the city.

The Bell has promised to withdraw from the local field, but will maintain a toll station at Blair, paying the home company 10 per cent on all incoming business and 15 per cent on all outgoing business, all to go through the local company's hands.

The purchase price, which both sides estimate will not exceed $15,000, includes only the aerial construction and outside equipment. The home company but recently installed new switchboards on the Blair and Kennard exchanges, and will not, therefore, take over any of the central office equipment. This will be taken down and placed elsewhere in the Nebraska company's service.

The Bell has made several propositions in past years to the home company offering to sell out if allowed to control the toll business, but its propositions met with no responsive action until the Independent company came squarely up against the proposition it now faces, that of having to rebuild practically all of its city lines. The cable system of the Bell also gave it an advantage in local service that prevented the home people from making any material progress in capturing the field.

The management believes that it would cost more to rebuild the city lines than it will be possible to purchase the Bell system under the system of price-fixing agreed upon, and as an additional inducement all it need do is to make a connection close by the home company exchange. It has been found almost impossible to buy new material at the present time.

The Independent company has not been able to earn any dividends in recent years because of competitive conditions and the heavy rebuilding program forced upon it by reason of depreciation. This condition exists in spite of the fact that it has been steadily increasing its gross revenues, from $17,586 in 1915 to $24,050 in 1916 and to $26,763 in 1917. The present capital stock is $10,000, and the book cost of construction is in ecxess of $17,000. The expenses in 1916 were $23,771, and in 1917 exceeded the revenues by a considerable sum, due to the fact the two new switchboards at Blair and Kennard cost $6,500.

The report of Treasurer Rohwer showed book accounts due of $5,600 with $3,270 cash on hand. The outstanding obligations of the company total $5,800.

The officials of the company have been assured by the state railway commissioners that a consolidation will receive the approval of that body, and that if necessary to raise the rates, as it is expected will follow, in order that the stockholders receive a reasonable return on their investment, that will be permitted upon a proper and correct showing.

The stockholders re-elected Henry Rohwer director for District No. 5 and John Taylor for District No. 1. After the meeting of stockholders had adjourned the directors met and elected the following officers: President, John Blaco; vice-president, E. R. Stewart; treasurer, Henry Rohwer. J. H. Christensen will be retained as secretary and manager.

Texas Telephone Co., of Waco, Asks for Rate Increase.

The Texas Telephone Co., of Waco, Texas, filed a formal petition with the city commission of Waco, Texas, on January 7 for an increase of the rental rates in Waco. The principal rates in Waco at present are $2 for residence and $5 for business telephones, unlimited service, including service to a number of nearby small towns.

The company proposes to inaugurate the following rates: $2.65 a month for straight line residence telephones and $6.50 for straight line business telephones, unlimited service. A measured service business rate is proposed, of $4 a month, limited to 80 outgoing calls a month, extra calls to be charged at 3 cents each. A special rate of $12.50 a month for public telephones is proposed, for unlimited service, with an alternative of a measured service pay station, with automatic coin collectors.

on a guarantee of $4 a month, all calls to be charged for at 5 cents each.

The local traffic load in Waco has been extremely heavy since the opening of Camp McArthur at that city, with some 40,000 soldiers located there. A large aviation field is also located at Waco. The company states that in order to render good service under present conditions it is necessary for it to install extra equipment to take care of the heavy traffic load and to pay higher wages to obtain a steady force of skilled operators. The rates proposed, the company states, will suffice to efficiently operate and maintain the exchange under present abnormal conditions, and should in normal times bring a return of approximately 5 per cent net on the investment in the business.

The proposition will be given immediate consideration by the city commission of Waco, it is stated.

New Emergency War Policy on Rate Increases in Illinois.

A new emergency war policy was put into effect last week when the Illinois Public Utility Commission granted the Mount Carmel Utilities Co. the right temporarily to increase its rates 15 per cent. The increased rates will be effective until the state commission can investigate the reasonableness of the new rate asked.

The new policy of permitting rate increases in certain cases before a hearing is had is designed to protect utilities that are hard hit through the stress of war and that shall show themselves in dire need of relief.

In every instance where it is applied, however, the company must provide for reparation to consumers in event the commission later decides against the increase.

Commissioner Patrick J. Lucey, in commenting on the ruling, said:

"The commission has a number of similar cases before it. In these cases the utility has made a showing that it was a paying institution, honestly conducted, until war conditions, involving the increased cost of labor, coal and materials entering into its operation exceeded its income and asks for a temporary order for increased rates.

"A permanent increase in rates, in most cases, would involve the necessity of a public hearing in which valuations and like questions would be considered. A final decision has not been made in the Mount Carmel utilities case."

Telephone Company Blamed for War Handicap in Capital.

A hearing on the application of the Chesapeake & Potomac Telephone Co. for permission to put into effect certain increases in rates for telephone service and for the abolition of certain classes of telephone service now furnished in the District of Columbia was held before the public utilities commission early this month.

Asking why the telephone company failed to install up-to-date automatic switchboards, in place of alleged obsolete equipment, to meet war needs, Jesse Crawford, representing the Federation of Citizens Associations, received from T. P. Sylvan the reply that "engineers of the company" thought the plan "impracticable."

Pointing out that the company was asking authorization to spend nearly $1,000,000 to house operators, Mr. Crawford said this would not be necessary if the company had installed automatic switchboards, with one operator handling as many calls in an hour as are handled now by one operator in a day.

Newark, N. J., was mentioned as a city with practically as many telephones as Washington has, but uses the automatic system.

Mr. Crawford said the amortization of the expense of installing new switchboards would take approximately four years, as 25 per cent of the operating expenses probably would be saved each year. He quoted figures from a Chicago telephone hearing some years ago to bear out his statement.

It was contended during the hearing yesterday that privately owned utility companies had "fallen down" throughout the country at the very time when they were most needed, and "when a crisis approached, the companies had not prepared to meet it."

Mr. Sylvan asserted that the elimination of the flat rate and the increase in charges which the company was seeking was only to meet the strain of war, and that the company had no intention of asking that it be made permanent.

Both Mr. Sylvan and Robert V. Marye, counsel for the company, asserted that the company, after the crisis has passed and business has again settled down to normal conditions, would be glad to restore all the conditions existing before the war.

For the presentation of additional evidence and to permit the protestants to file briefs, it is stated that the commission will re-open the telephone rate hearings within the next two weeks.

Toll Connection with Exchange at Wabasha, Minn., Denied.

The Minnesota Railroad & Warehouse Commission, in a ruling handed down January 16, denied the application of the Greenfield Farmers Telephone Co. for a physical connection between its local exchange and the toll lines of the Tri-State Telephone & Telegraph Co. at Wabasha.

The commission was of the opinion that inasmuch as the Kellogg and Wabasha exchanges operated by the complainant constitute one exchange area and that since there already exists a physical connection between the Tri-State toll lines and the exchange at Kellogg, this petition is, in effect, an application for an additional physical connection with an exchange which already has a connection with the toll lines of the respondent company. Under the circumstances, the commission held that the second connection is not warranted.

The Greenfield Farmers company, it developed at the hearing, operates an exchange with 220 subscribers at Kellogg and serves 123 subscribers from its Wabasha exchange. The two exchanges are connected so that all subscribers connected to the company's lines can communicate with any subscriber on the system without any other charge than the regular rental rate, thus constituting one exchange area.

Both the Bell and Tri-State toll lines are connected with the petitioner's local exchange at Kellogg but there are no toll lines connected with the Wabasha exchange. The subscribers, however, have access to the toll lines at Kellogg over the trunk lines of the company between Wabasha and Kellogg.

An intervening petition was filed by the Dwelle Telephone Co. which operates a local exchange in competition with the Greenfield Farmers company at Wabasha with 336 subscribers, claiming that irreparable injury would be done to its business if the petition were granted.

The principal contention of the petitioner in seeking the connection was that the toll service from Wabasha over the Wabasha-Kellogg trunk was poor and frequently not commercial.

The commission, in its opinion, states that the evidence shows that much of the inconvenience and difficulties in the toll service of the subscribers of the petitioner at Wabasha and vicinity are due entirely to the neglect and failure on the part of the Greenfield Farmers company to keep its own equipment in a proper state of repair and to enforce proper operating rules among its own operators so that immediate response would be given by the operators at Kellogg when called by the operators at Wabasha.

The commission states further that the poor service which obtains is largely due to the fact that the trunk line of the petitioner parallels a high tension power line and is not kept in a proper state of repair or properly transposed so as to eliminate the electrical induction from the power line. No conditions exist by way of electrical disturbances or otherwise which cannot be remedied by the petitioner if it so desires, particularly since the toll lines of the respondent along the same route between Wabasha and Kellogg are rendering good service.

As the added convenience to the petitioner's subscribers at Wabasha by connecting its switchboard with that of the Dwelle Telephone Co. for toll service is

not material as compared with toll service which may be received over the Wabasha-Kellogg trunk in good condition and properly maintained, the commission was of the opinion that the petition should be denied and so ordered.

Commission to Compel Consolidation at Red Cloud, Neb.

Notwithstanding the repeated refusal of the Nebraska legislature to confer upon the state railway commission the power to say whether a second public utility may enter a field already served, the commission has announced its intention of compelling a consolidation of the rival exchanges at Red Cloud of the Lincoln Telephone & Telegraph Co. and the Farmers' Independent Telephone Co.

It was moved to take this action by a petition signed by 400 patrons of the companies, who set up that the burden and nuisance of two telephone systems were undesirable; that it added to the cost paid for service; that it was impossible to call up on one exchange all persons having telephones, and that as a result of the warfare in progress between the two companies only partial toll service was given. The petition asked that the companies provide for an interchange of local service as well as toll service or that they be ordered to consolidate.

At the end of a day's hearing Chairman Hall of the commission announced that the state engineers and accountant would be instructed to make at once an engineering and accounting study of the two systems, and that as soon as a physical valuation was complete, a hearing would be held at Red Cloud and a consolidation ordered and a new schedule of rates fixed.

This is in effect a victory for the Lincoln company. In order to avoid the war which the Farmers' company was intent upon prosecuting, the Lincoln company first offered to consolidate the two properties and take whatever share of the stock its property contribution to the capital entitled it. When this was refused, it offered to make a consolidation on that basis and then sell enough stock to the local company to give it control.

The Farmers' company replied with a refusal to consider any proposition other than a sale to it of whatever property of the Lincoln company at Red Cloud it desired to use in rebuilding its exchange and lines and the complete withdrawal of that company from the local field, leaving only its toll lines. The Lincoln company declined on the ground that Red Cloud is one of its toll distributing centers and that good business policy dictated that it do not leave this property in the hands of any corporation in which it was not financially interested.

The Farmers' company has not paid any dividends in years, and had a good-sized surplus. Local sentiment was with it, and a number of business men signed an agreement to order out the Lincoln telephones. They have since done so, and the Lincoln company list has dwindled to 220, or nearly half of its former size.

The first move in the war came when a committee of citizens that the Lincoln people say was instigated to take such action by the local company, started a boycott. The local company denied this, but claimed it had the right to get the other company's patrons away from it if it could.

The Lincoln company retaliated by depriving the Farmers' company of toll line facilities, by severing a trunk between the two exchanges that has been in use for two years. Claiming that this was done without the approval of the commission, was a violation of law and that it was also in violation of a long-time contract between the two companies, the Farmers' company applied to the state commission for an order restoring this connection.

The hearing on this application came before the commission immediately in advance of the hearing on the citizens' petition for a consolidation. The Lincoln company defended on the ground that it was a matter over which the commission had no concern since it involved the enforcement of a contract right. The contract had been made by the Lincoln company in 1910, when it was seeking to extend its toll line facilities in southern Nebraska in opposition to the Bell. Under its terms its long distance lines were placed on the Farmers' exchange. The Bell had a rival exchange in Red Cloud at the time.

In 1912 the Bell sold all of its property in that section of the state, including the Red Cloud exchange. The Lincoln company applied to and secured from the commission, over the other company's objection, the right to run the toll lines into its exchange, and giving service through a trunk connection between the two. One of the provisions of the original contract was that the Farmers' company should do all in its power to build up the business of the other company, which was not then a rival. On the ground that the Farmers' company violated this proviso, the Lincoln company justified its severance of toll connections.

The state commission refused to hear any evidence in the matter and sustained a motion of the applicant that the connection be ordered restored. Chairman Hall said that the commission's power rested only over rates and service. When the Lincoln company cut the toll connection, it interfered with the service, and he declined to allow the offer of any evidence that the people had not been inconvenienced. He said the commission was the duly appointed guardian of the people and would take such steps as were necessary to protect and enforce the rights of the public.

In a street railway case, decided some years ago, the supreme court of Nebraska held that the constitution and the law gave the commission complete control over service, and that no change in service could be made unless permission had first been secured from that body. Chairman Hall, therefore, held that the only question before the commission was whether a change in service had been made without approval of the commission, and as the act complained of was admitted by the pleadings of the defendant to have been done, the commission would order the connection restored.

The commission also refused to fix the amount of a supersedeas bond, holding that the execution of an order of injunction could not be stayed on appeal because the amount of damages caused by a delay in restoring conditions could not be estimated. The Lincoln company, however, gave notice that it would apply to the supreme court for an order fixing the bond, and that, as the order involved the confiscation of its property through compelling it to furnish a service certain to destroy its local exchange business at Red Cloud, it would take the case to the federal supreme court, if necessary.

Negotiations for Purchase of Tilden (Neb.) Plant.

M. R. Dutcher, former owner of the Pierce (Neb.) Telephone Co., a telephone man of wide and successful experience, is negotiating for the purchase of the plant at Tilden, which operates 275 telephones. Mr. Dutcher recently purchased the plant at Plainview of C. R. Smith, the owner, but before the transfer was made Mr. Smith said that he did not know how to put in his time and paid $500 for a release of the contract.

Mr. Dutcher has reported to the Nebraska State Railway Commission that he can purchase the Tilden plant at an average price of $30 per station, and desired to know whether that body had any objections. In its reply the commission said that it could not state until it had examined the history of the company, but warned Mr. Dutcher that he must make sure that no part of the property had been built up out of surplus earnings, as the commission would not allow any interest to be earned thereon, under its holding that these are held in trust for the subscribers.

Eagle (Neb.) Telephone Co. Again Asks for Rate Increase.

Setting up that it is necessary to purchase a new switchboard and to repair a number of its lines and that there is not money in the treasury sufficient to pay for such improvements, the Eagle (Neb.) Telephone Co. has asked the Nebraska State Railway Commission for permis-

THE SHIBBOLETH OF TELEPHONE COMPANIES
HIGHER OR REASONABLE RATES
PRUSSIANISM
LONG WINDED TALKER OVER THE TELEPHONE
TWO THINGS THAT MUST GO
OFF THE EARTH
BIG OVERHEAD
THE PUP CAN LIVE ON 10¢ WORTH OF MEAT A DAY, BUT THE GROWN DOG WILL STARVE
GROWN UP TELEPHONE CO. TO DAY
NEW TELEPHONE COMPANY 15 YEARS AGO
BIG TAXES
HIGH COST RAW MATERIAL
SMALL CHARGE FOR SERVICE
FOR TELEPHONY
ECONOMICAL BASIS MANAGEMENT
TAKES A BIG BITE OF PIE EVERY TIME HE IS HUNGRY, YET THE LAYMAN THINKS IT'S ALL PROFIT
INDEPENDENTS
BELL COMPANY
TELEPHONE PROFITS
RELATIVE SIZES IN ILLINOIS
STORM KING

The Cartoonist's Views of the Telephone Field as Gathered From Reading "Telephony" Each Week.

sion to increase its rates to its 225 subscribers, most of whom are on farm lines. The present rates are: Business telephones and individual residence telephones in town, $1.25; two-party, residence and farm lines, $1. The rates asked for are $1.50 and $1.25 respectively.

The company made a similar application some eight months ago, but when the commission indicated that the history of the company showed that it had been paying too high dividends and laying nothing aside for depreciation, the application was withdrawn. The manager, Mrs. McDonald, said at the time that every time the board, at a meeting, found any money in the treasury, it declared a dividend. The need of new equipment is now acute; hence the new application.

Asks to Discontinue Giving Time of Day to Patrons.

As a further step toward conserving telephone service in Atlanta, Ga., whose calling rate per station is said to be the highest in the United States, the Southern Bell Telephone & Telegraph Co. has asked the railroad commission for permission to discontinue telling its patrons the time of day.

It is believed this single step in service conservation will relieve the switchboard of 12,000 calls a day by people who ask the operators what time it is. The company is not required to perform this service, but it will not discontinue it without the permission of the railroad commission.

Holds Cleveland Has Charter Right to Fix Telephone Rates.

Judge Morgan in the common pleas court at Cleveland, Ohio, overruled a motion offered by the Cleveland Telephone Co. for dismissal of the city's injunction suit which seeks to prevent the company from imposing higher rates. The court ruled that the city, under its charter, has the right to regulate telephone rates within the city boundaries.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

January 5: Application filed by the Pacific Telephone & Telegraph Co. for permission to present to the United States government for $10 a telephone line of 14 miles in the Yosemite National Park which was valued at $2,100. It was explained by the commissioners that the $10 price asked by the company was merely in conformity with legal procedure and that the line, which runs from El Portal, Mariposa county, to Yosemite village, was a gift to the government from the company.

January 10: The commission authorized the Downey Home Telephone & Telegraph Co., which operates in Los Angeles county in the towns of Downey, Norwalk, Artesia and Bellflower, to issue $15,000 stock, to retire the same amount of 5 per cent bonds. The stock is to be sold to net par.

FLORIDA.

February 19: Hearing at Tallahassee on the investigation as to the reasonableness of the toll charges over the lines of the West Palm Beach Telephone Co.

GEORGIA.

February 5: Postponed hearing of the petition of the Southern Bell Telephone & Telegraph Co. for authority to make rigid enforcement of a provision of its subscriber's contract restricting the use of its telephone to the subscriber, subscriber's agent or other representative, and compelling all others to use telephone pay stations.

ILLINOIS.

January 19: The commission dismissed the complaint of the Rockford chamber of commerce against the receivers of the Central Union Telephone Co. relative to toll charges between Rockford and Camp Grant.

January 22: Hearing at Chicago on the complaint of the city of Mt. Olive vs. the Mt. Olive Telephone & Electric Co., as to telephone service at Mt. Olive. No. 7124.

January 22: Hearing at Springfield on the application of the Mendon Telephone Co. for authority to change rates for telephone service at Mendon and vicinity. No. 7522.

MINNESOTA.

January 16: The commission denied the application of the Greenfield Farmers Telephone Co. for a physical connection between its local exchange and the toll lines of the Tri-State Telephone & Telegraph Co. at Wabasha, Minn.

January 25: Hearing at St. Paul on the application of the Town & Country Telephone Co. for authority to purchase all of the telephone property of the Canby Telephone Co., including exchanges located at Canby, Porter and St. Leo, for $9,000, the purchase price agreed upon by both parties.

MONTANA.

January 12: Hearing on the application of the Farmers Telephone Co. for permission to increase its rates at Buffalo.

NEBRASKA.

January 15: In the matter of the complaint of the Farmers' Independent Telephone Co., of Red Cloud, vs. the Lincoln Telephone & Telegraph Co., it appearing to the commission from the pleadings that the respondent admits having severed the toll connection between its exchange and that of the complainant and that the same was done without authority from the commission, the commission ordered that the toll connection be restored. The application of the respondent to have amount of supersedeas bond fixed was denied. Testimony taken upon intervention of Red Cloud citizens, and ruling made that after an engineering and accounting study be made of the two plants, a hearing be held at Red Cloud, with the object of ordering a consolidation of exchanges, as prayed for.

January 15: Application of Lincoln Telephone & Telegraph Co. for permission to discontinue 20-party rate on Yutan exchange, filed.

January 15: Application of Nebraska Telephone Co. for permission to correct toll rate from Mitchell to Royal, filed.

January 16: Application of Republican Valley Telephone Co. for permission to offer optional common battery rates, filed.

January 16: Applications filed by Lincoln Telephone & Telegraph Co. to cancel switching rate on Superior exchange; to offer optional metallic farm rate, ten-party, on Edgar exchange; to cancel unused rates on Fairbury exchange, and for approval of optional metallic rates on Ong exchange, filed.

January 16: Application filed by Hendley-Holbrook Telephone Co. for permission to charge rate of $1 for all patrons alike. This application was in accord with a previous order of the commission that company should cease discrimination in rates between stockholders and non-stockholders.

January 16: Application of Virginia Telephone Co. for permission to correct schedule of exchange rates, filed.

January 16: Application of Cedar County Mutual Telephone Co. for permission to publish rates for extension sets, filed.

January 16: Application filed by the Eagle Telephone Co. for increase in rates of 25 cents a month. The proposed rates are $1.50 for business and individual residence and $1.25 for two-party and farm lines.

January 16: Complaint of A. L. Tidd, of Plattsmouth, against Lincoln Telephone & Telegraph Co. of poor service, filed.

January 16: Complaint of Pine Glen Telephone Co. against E. A. Carlson that he permits free use of his telephone to non-subscribers. The company is located in Brown county, and a host of minor troubles, including a charge that one stockholder—it is a mutual company—took down half a mile of pole line when he concluded to quit service, have caused notice to be served that unless the members settle their differences, they will be summoned to Lincoln.

January 16: In the matter of the Farmers' Co-operative Telephone Co., of Jansen, complaints against which as to discrimination in charges have been pending, it was ordered that uniform rates be charged stockholders and renters and that management be paid a salary.

OHIO.

January 3: The commission announced that, on its own motion, it will make an investigation as to the reasonableness of the proposed rate increases of the Cleveland (Bell) Telephone Co.

February 7: Hearing on the increased residence rates of the Central Union Telephone Co. in Columbus, against which protest has been made by City Attorney Scarlett in behalf of 400 Columbus telephone patrons.

PENNSYLVANIA.

January 4: Hearing on the complaints of residents of Sinking Spring that the Bell Telephone Co. had refused to furnish service in that town. It was declared, in defense, that service had not been refused where proper contracts were offered.

VIRGINIA.

January 11: The commission authorized the Piedmont Telephone & Telegraph Co. to increase its rates in Shelby as follows: Single line business telephones, from $2 to $2.50, and single line residence telephones, from $1 to $1.50 per month.

WEST VIRGINIA.

January 25: Hearing on the application of the Littleton Telephone Co., of Littleton, Wetzel county, for authority to make a general increase in its service rates.

WISCONSIN.

January 23: Hearing in the case of G. O. Rockstad et al. vs. the Mt. Horeb (Wis.) Independent Telephone Co., relative to rates and service. U-1222.

Act Relative to Purchases of Common Carriers Extended.

The date on which the act relative to purchases of common carriers, approved by Congress October 15, 1914, has been extended for the fourth time to January 1, 1919, in a resolution approved by the president January 12. It was further provided that this act become effective January 8, 1918, as to any corporations hereafter organized. This act is known as amendment No. 4 to the federal anti-trust act.

The first extension to the effective date of this act was made May 15, 1916; the second, August 31, 1916, and the third, March 4, 1917.

Convention of the Western Pennsylvania Association.

The annual meeting of the Western Pennsylvania Independent Telephone Association was held at the Fort Pitt Hotel, Pittsburgh, Pa., last week, January 18 and 19, with about 50 members present. The election of officers resulted in the selection of the following men to direct the company's affairs during the ensuing year:

President, Fred J. Heavens, Pittsburgh.

First vice-president, A. M. Crichton, Uniontown.

Second vice-president, J. F. Horn, Vandergrift.

Secretary-treasurer, J. H. McCarthy, Erie.

An interesting address on the subject of "Associated Effort" was made by E. B. Fisher, of Grand Rapids, Mich., chairman of the board of directors of the United States Independent Telephone Association, in which he impressed upon the minds of his hearers the importance of their supporting the state as well as national associations.

The next quarterly meeting of the association will be held in Pittsburgh at a date to be fixed later.

Sundry Snapshots Along the Trail

Observations and Comments, Pertinent and Otherwise, On the Sunshine and Shadows of Telephone Work

By Well Clay

The best land on earth today
Is the good old U. S. A.;
  And there is no other place I'd rather be.
There a guy has got some chance,
And when I get home from France
  It'll be the little old U. S. A. for me.

I'll be easy then to find,
When this war is left behind,
  If any friends should chance to come my way,
I'll be mighty glad to meet
Any such along my street—
  You know—Main street in the U. S. A.

When we've licked the kaiser's armies
And straightened out Berlin,
  Our little job in Europe will be done;
Then we'll say good-bye to fighting,
Bid our new-found friends farewell,
  And turn our faces towards the setting sun.

The Tommies and the Frenchies
Will come to see us off
  As we march aboard the transports bound for home;
It'll surely be some happy day
When we get back home to stay,
  Never far from Main street more to roam.

There'll be lively times on Main street
  In the U. S. A.,
When this blooming war is over
  And the kaiser's laid away;
The girls will all be there,
  With eyes a shining bright,
The movies will be running
  And the streets lit up at night;
Our worries will be over,
  When war's clouds have rolled away.
Then I'll meet you down on Main street,
  In the U. S. A.

If I were over in the trenches, it seems to me, that Main street in my own home town would loom up in a far different light than it had ever before appeared. It would look better and better, the more I dwelt on what my privileges used to be regarding it, and it would seem to me that if I could once more tread its familiar length that I should be happy.

Still it is altogether probable that, once I was back, I would lose interest in the matter—like the Pilgrims who crossed the stormy seas and endured hardships without number that they might worship as their consciences dictated, only to fall asleep in church occasionally or forget to go to church at all when the fishing was good.

The boys in France are not much farther away from Main street, figuratively speaking, than the ordinary telephone man is away from the requirements of his business a few years ago as compared with those of today.

Take it between the commissions, and the federal requirements. What would you give today to run your business one year as you used to without having to answer to any one except the persons to whom you owed accounts payable? Wouldn't it be a snap? You would be fishing most of the time, probably.

As the matter now stands, we must in the next few months make out reports and pay taxes, federal, state and income, as well as the corporation tax and report.

There will be few exceptions and no decreases over former years. There will be the reports to the Interstate Commerce Commission and the railroad and warehouse commission; there will be reports to the mercantile agencies as to our standing, to say nothing of requests for reports from large manufacturers as to our equipment and the number of telephones in use.

And when we get home late after a hard day's work making out reports, we may have to formulate some kind of a report as to the reasons we are late to supper, or why we did not bring the list of things we were asked to from the store.

We are sure that a vast amount of the information contained in these reports is never put to any use, but, like the hoards of potatoes which Germany put aside for the war, only mould away in some vault and becomes a useless burden to be cleared away later and carted to the dump.

On the other hand, I believe that the people who have to pay the additional rates, which have in most cases been imposed upon them for service, would be glad to do away with so much supervision at the expense of their pocket books. As President Wilson said the other day, we, as a nation, are over-organized. This, I believe, is true, and also that the executive departments are so filled to overflowing with all kinds of subordinate executive and supervising officers that they are stepping on each other's feet and slowing down the machinery to an alarming extent. A man can have so much fishing tackle of a fancy nature along on a trip that he will not be able to catch any fish, because it takes all his time and efforts to take care of the tackle, and I believe governments can do things just as foolish.

Why would it not be wise, during the war, to discontinue the reports to the Interstate Commerce Commission and let the information be secured for the government by the state commissions, who also get it, thus doing away with at least one duplicate expense? It would also provide room for committees who might be needing them for business relating to the national prosecution of the war.

Let managers spend the time gained from making out reports in canvassing for the Liberty Loan. It will pay better in the long run.

Let's get back on Main street once more.

APHORISM: Too many doctors are bad for the patient.

What Is Your Company Doing?

Chats About Company Doings.

By S. R. Edwards.

"The Busy Hour for Telephoning" in these times of "less" days is quite a variable factor. In the larger cities especially, it would seem that the telephone traffic in the offices in the residence districts would be more than usual while that in the business districts would be less. The peak load for residence offices, to some extent, corresponds with that of the business district, except possibly in the evening between 7:30 and 8.

The busy hour for telephoning is a topic that can be made the subject of many interesting discussions. In the weekly advertisement of the Modern Telephone Co. the manager tells something about the busy hour between 9 and 10 o'clock in the morning and the various causes which make up the load. He then points out that the report, "line is busy," is quite often the result when endeavoring to use the telephone at that hour and the whole situation might be relieved if calls were made later in the day.

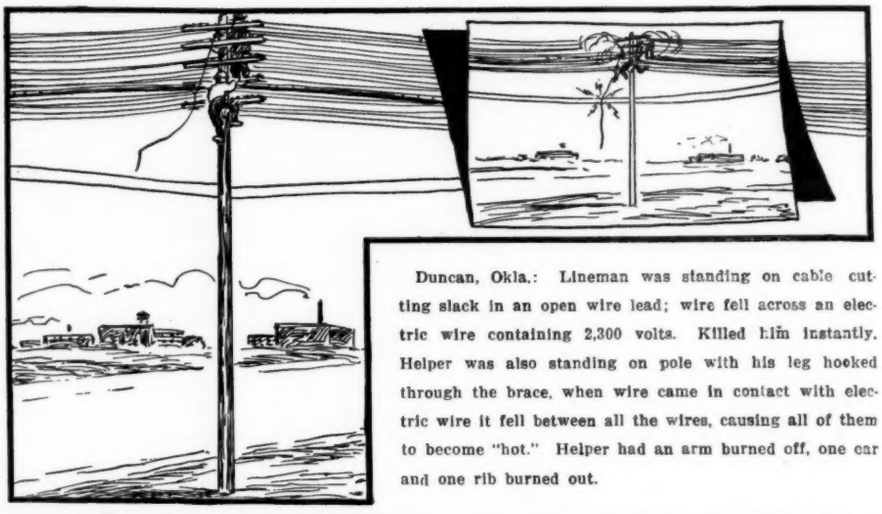
In the closing paragraph of the advertisement the matter of visiting over the telephone during the busy hour is very briefly discussed and an appeal made to have consideration for others and not to adopt a selfish attitude and to use the party line telephone only for reasonable and necessary purposes.

The illustration from the Safety First Bulletin of the Texas Telephone Co. depicts an accident to a lineman working on an aerial line. In this case not only was the lineman killed but his helper lost his arm.

"Practice safety yourself—others will follow you," is the heading of an item in the bulletin which tells of an accident in Temple, Texas. Nails left in the barrel had their points bent downward and in removing a position of an old keyboard that had been thrown into the barrel, a nail caught in the thumb of the workman at the small joint and passed full length upward under the skin. The person who originally opened this barrel should have removed all of the nails, as when they are left they are almost certain to snag the clothes or flesh of someone.

Another accident is reported from Auburn, Ind., where a man was injured by falling from a 30-ft. pole while engaged in the stringing of open wire over a trolley. The wire slipped through his hand and slacked down on the trolley wire, which carried a voltage of 3,300. Of course, the man received the shock which caused him to fall. The injury from this fall laid him up for over six months.

"Eternal vigilance is the price of Liberty" is known to experienced linemen as: "Eternal vigilance is the price of Safety."



Duncan, Okla.: Lineman was standing on cable cutting slack in an open wire lead; wire fell across an electric wire containing 2,300 volts. Killed him instantly. Helper was also standing on pole with his leg hooked through the brace, when wire came in contact with electric wire it fell between all the wires, causing all of them to become "hot." Helper had an arm burned off, one ear and one rib burned out.

"Safety First" Bulletin of the Texas Telephone Co. and Associated Companies Tells a Story Graphically and to the Point—Actual Occurrences Are Cited as Examples.

MODERN TELEPHONE COMPANY
INDEPENDENT
TELEPHONE
INDEPENDENT CITY, ILLINOIS

The Busy Hour for Telephoning

If we comprehend that residences are ordering their groceries and supplies—that retailers are ordering from the wholesalers, that freight depots are notifying their consignees, and professionals making their daily appointments—at just the time we are doing our own ordering, it must be between nine and ten o'clock in the morning.

If the "line is busy" when we call at that time, it is also busy for others when we are using it, and the whole situation might be relieved if we called later in the day.

If the person who persists in visiting during the busy hours will have fine consideration for others, she will do it later in the day. She will not under any circumstances talk over five minutes. And she will use the telephone on party lines for reasonable and necessary purposes only.

Modern Telephone Company
The Independent Building
Corner Service and Progress Sts.
Contract Dept. No. 100

The Modern Telephone Co. Runs an Advertisement Each Thursday in the Local Evening Paper at a Cost of $4.20. This is the Full Size of the Advertisement.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

881. Is it true that when 5,000 calls are being handled during the busy hour, 2,500 calls will be handled during one-half of the busy hour? If not, how many calls are likely to be handled during any period of 30 minutes?

882. Are peg count figures always accurate? When is it allowable to question their accuracy? Is the possible error likely to be either positive or negative? What is the importance of this feature of peg counts when designing power plants for mechanically-operated central office equipment?

883. Is it practicable to record several components of "trunk time," for instance, when taking the "length of conversation"? What is required, in addition to the peg count, to make an effective study of inadequate connecting circuit conditions? Explain why the peg count must be supplemented by other records for this purpose. How many observations must be made to obtain a workable value for "trunk time" in an office of 8,000 lines? How many in an office of 1,200 lines?

884. Is it permissible to take all readings for "trunk time" close together or must they be distributed over the entire day? What happens in subscriber-operated equipment when there are no connecting circuits available to handle the incoming calls? What happens in centrally-operated equipment under the same circumstances? Do not both conditions amount to the same thing from the traffic engineer's standpoint, delayed service?

885. How is the schedule for making observations of "trunk time" made up? How would the schedule for taking observations of "length of conversation" be made up? What is the rough relation between these schedules and the traffic load of the office?

886. How is the "trunk time" used in determining the number of connecting circuits that must be provided to handle the traffic? What effect will long "trunk time" have on the number of connecting circuits required?

CHAPTER XXVIII. Nature of Telephone Traffic (Continued).

887. *Trunk time and length of conversation.*—The reader must not confuse "trunk time" with "length of conversation." The conversation may have ceased, in any given case, but so long as the connecting circuit is not available for use in serving another call, it must be charged to the call for which it was placed in service. In ordinary manual equipment, a cord circuit is not available as long as the plugs are allowed to rest in the jacks.

When the study shows excessive trunk time, therefore, it is advisable for the manager of such an office to determine whether the operators are slow in removing connections. In other words, is the local "disconnecting time" unduly long?

The "disconnecting time" is one of the means open to the operating company to increase the efficiency of the connecting equipment. Often a little attention to this feature of the operating routine will greatly improve the average service given the public by reducing the average trunk time.

888. *Analysis of trunk time.*—It is evident, upon the most casual consideration, that the trunk time is the sum of several other operating periods. In manual equipment it comprises the time required by the operator to perform the duties incidental to completing the connection, the time devoted to actual conversation, the time required by the called subscriber to answer the bell, and the time required by the operator to remove the connection.

Of these components, the first and last may be controlled, to a certain degree, by the management of the telephone company, while the second and third are absolutely beyond their influence. It is important, however, that the "length of conversation" be known. This is the longest single component of the "trunk line" and it is susceptible of exact determination.

There is no limit to the number of conversations that may be timed and recorded. In order to obtain a workable average, at least as many should be recorded as will be equal in number to one-tenth of the lines in service. The observations should be distributed throughout the traffic day in the same way as the observations for determining average "trunk time."

889. *Length of conversation.*—While the average "trunk time" is by far the most important item in the study of traffic for the purpose of designing new equipment or redistributing existing equipment, the "length of conversation" is also a factor of great importance. This is obvious when it is remembered that the "length of conversation," in many types of improved equipment, is very little different from the "trunk time."

When the equipment is so designed as to restore itself to normal automatically when the receivers of connected telephones are replaced upon the hooks, the "disconnect time," for instance, will be reduced to practically nothing. In full subscriber operated central office equipment, for illustration, the "trunk time" is reduced to the sum of the "length of conversation," the "subscriber answering time" and length of time required to put the call through the equipment and to start the ringing of the called party's bell.

The most careful studies have been made to determine the general average "length of conversation" for the largest exchanges without definite and permanent result. In other words, the "length of conversation" in one office of the exchange district may be much different from the "length of conversation" in another office immediately adjoining it. In offices serving business communities, the average "length of conversation" is usually less than it is in offices serving residential districts. It is one of the components of the total "trunk time" that is absolutely beyond the control of the operating telephone company.

890. *Practical methods for unusual offices.*—The general procedure is the same as it is when taking the observations to determine "trunk time." One method that is sometimes used is as follows:

When the call is received at the answering jack, the observer plugs into the calling line in the multiple with a plug connected to a special operator's head telephone receiver wired in series with a small capacity condenser. This observing head telephone receiver must be wound to have a very high impedance. This is to prevent undue transmission loss when it is bridged across the line circuit under observation.

As soon as the called subscriber answers the bell, the stop watch is released by the observer and is allowed to run until the *first one* of the two connected telephone receivers is replaced on its

hook. The elapsed time is then recorded as the length of one conversation.

Another method is sometimes used. When the observations are to be made by this method, the observer stands behind the operators at the switchboard and releases the stop watch when the *calling* supervisory signal indicates that the called subscriber has answered. When *either* of the supervisory signals are restored to normal, indicating the replacing of one of the connected receivers on the hook, the watch is again arrested and the elapsed time recorded as the length of one conversation.

891. *Apportionment of observations.*—Regardless of the actual method used, it is important that the results be accurate and that their average value furnish a basis upon which the design or redistribution of equipment may be made.

It is advisable to take as many observations as possible but in no case less than one-tenth of the number of lines connected in the office. These observations must be apportioned to the various hours of the day in the same way as the observations for "trunk time" were apportioned. In fact, the schedule used for the latter may also be used for the former. It is to be borne in mind, however, that the value of both averages—"trunk time" and average "length of conversation"—is greatly enhanced when the total number of observations taken is increased. It is also true that the average for the entire day should be worked out from the total list of observations and *not* from the hourly averages.

There is an obscure relationship between the average "length of conversation" and the hourly traffic just as there is a similar relationship between the average "trunk time" and the hourly traffic. When the traffic is heavy, during the rush hours, it is often found that the average "length of conversation" for those hours is much less than it is when the traffic is lighter.

It is possible to work out a psychological theory to account for this fact, as the condition is unquestionably one that exists although the relationship has never, as far as the author is aware, been reduced to a mathematical law.

892. *Typical values for "length of conversation."*—It is very seldom that the average "length of conversation" is found to be less than one and one-half minutes. It is also rare to find it much above two minutes. In one instance investigated by the author in which the calling rate was very high for the business day, the average length of conversation was found to be 112 seconds.

In one of the very largest exchange districts in the world, a careful record of observations of "length of conversation" has been kept for a long time. The average for about 69,000 such observations was 126.7 seconds and for 128,000 observations, 128.6 seconds. In the office showing 112 seconds for the length of conversation, the traffic consisted almost exclusively of calls to and from business circuits. In the other case, the traffic consisted of calls from all sorts of circuits and it is probably a much closer average of the "length of conversation" for all classes of service than the shorter period.

In a small office of 1,500 lines, serving a mixed list of subscribers, the average "length of conversation" was found to be 105.5 seconds. In still another case it was found to be only 80.1 seconds.

As a general rule, the result is to be viewed with some suspicion when it is markedly long or markedly short. It would seem safe to figure on a maximum of about 130 seconds. It is hardly likely that any large office can be found in which the true average "length of conversation" is much more than this.

The number of observations made for the purpose of averaging the "length of conversation" may always be increased with a corresponding increase in accuracy. In fact, this is true of the observations for averaging the "trunk time" as well as the other time components of the call. The results obtained, when a limited number of observations are apportioned throughout the day in proportion to the hourly traffic, will be found, however, to give results in every way dependable.

893. *The subscriber answering time determination.*—The subscriber answering time is one of the very difficult determinations when ordinary manual equipment is in question. It is observed in any one of several ways. A supervisory head telephone receiver, plugged into the multiple of the calling line, may be used as in observing "trunk time" and "length of conversation." The stop watch should be released when the operator ceases ringing the *first time*.

Should it be necessary for her to ring again, the stop watch should not be disturbed, but should be allowed to run until the called subscriber answers. Should it happen to be one of the "don't answer" calls that is under observation, the observation may be so recorded after making sure that there is no possibility for the call to be completed.

It is important to note that all calls for busy lines, all calls for telephones that do not answer, and all calls for lines that are out of order, should be carefully noted. The percentage of each class of ineffective calls in any office is always a matter of interest and sometimes of great value in the exchange's operation.

If such calls are carefully recorded with the effective calls under observation, a percentage may sometimes be worked out without additional trouble. It is necessary that the total number of observations be greater than the number suggested above for "trunk time," however, in order to confer a fair value on an average of this character.

894. *Typical values for subscriber answering time.*—The subscriber answering time is, to a certain extent, determined by the operating conditions. For ordinary manual equipment in which the ringing is done manually by the operator, the "subscriber answering time" is an important time component of the "trunk time." When machine ringing or automatic ringing methods are introduced, the "subscriber answering time" is almost instantly reduced.

For the manual office, the following typical values will serve as a rough guide as to the accuracy of the observed averages. In one very busy office serving business circuits, the author found the average subscriber answering time to be 12.4 seconds. It very seldom is more than 20 seconds nor is it, in pure manual equipment, often less than 10 seconds.

895. *The disconnect time determination.*—After the completion of the conversation, it is important that the connecting cord circuit be restored to normal and that the busy test be taken from the line circuits involved at the earliest possible moment.

It is obvious that the average length of time required for the disconnect is a function, to some extent, of the discipline in the operating room. In other words, a slight relaxation in the operating standards will be very apt to permit connections to remain longer after the conversation is over than would be the case otherwise. The only observation required to determine this component of the "trunk time" is the elapsed time after the *first* supervisory signal is restored to normal and before the connecting plugs are restored to normal.

(*To be continued.*)

Ohio State Adopts "Daylight" Fuel Saving Order.

President C. Y. McVey of the Ohio State Telephone Co., which operates 70 exchanges and employs 3,500 persons, has issued a "daylight" fuel saving order.

It provides that all employes, except operators, begin work at 7 a. m. and quit at 4 p. m., instead of beginning at 8 and quitting at 5. Operators' hours are as usual.

Mr. McVey made an appeal for the saving of fuel in every manner possible.

Site for New Exchange Building in Versailles, Ky.

The Fayette Home Telephone Co. has purchased a site in Versailles, Ky., upon which it soon expects to commence the erection of a new exchange building. It is estimated that the structure will cost in the neighborhood of $15,000.

Biographical and Personal Notes

E. M. Slemmons, Columbus, Ohio, salesman for many years for the Ohio State Telephone Co., has been admitted to the officers' training school at Camp Hancock, Augusta, Ga. He served in the Spanish war and has altogether 11 years' experience in army and national guards. His uncle, the late John S. Slemmons, was one of the original organizers of the Ohio National Guard.

Lieut. John M. McGregor, assistant manager of the Memphis Telephone Co., Memphis, Tenn., was called for active duty in the signal corps, U. S. R., and left for Little Silver, N. J., January 7. Mr. McGregor made application for the signal corps the last of September and received his commission as first lieutenant on November 27. He is well fitted for duty in his chosen line as he is a thorough telephone man in all branches and will give a good account of himself in his new field.

Lieut. John M. McGregor.

Mr. McGregor was born in Berlin, Md., and has had about 12 years' experience in telephone work with different companies. About two years ago he took up the study of law, and was admitted to the bar of Tennessee in August, 1918.

W. H. Hay, of Pittsburgh, Pa., state service engineer of the Eastern Traffic Association of Independent Telephone Companies, has severed his connections with the telephone field, to engage in the motor truck game. He is now field representative of H. Kleinhans Co., motor truck department, distributors of Sterling and Acason trucks and Biggam trailers.

T. L. Dunlap, formerly special agent for the Texas Long Distance Telephone Co., with headquarters at Waco, has been appointed special agent with headquarters in Sherman. His duties will be to look after the interests of the company in the northern part of the state, including the plant, traffic and commercial departments.

Milton Barratt, manager for the Lincoln Telephone & Telegraph Co. at Sutton, Neb., has resigned, and after an enlistment in the officers' training school of the government aviation section has reported at San Antonio, Texas.

R. E. Dutcher, of Plainview, Neb., was a visitor at TELEPHONY's offices early this week. Mr. Dutcher recently purchased the Plainview Telephone Co. and sold it back again to its old proprietor.

A. L. Haecker has been appointed treasurer of the Lincoln (Neb.) Telephone & Telegraph Co., to fill the vacancy caused by the death of Seth W. Eddy. For a number of years Mr. Haecker was the head of the dairy husbandry department of the College of Agriculture at the University of Nebraska. He resigned several years ago to enter business life with the Woods Bros. Silo & Mfg. Co.

A. L. Haecker.

Jack Cavitt, of Red Oak, Texas, recently purchased the telephone exchange at Sterrett in Ellis county, merging it with the Red Oak exchange.

Captain W. S. Vivian has arrived safely in France and has taken charge as traffic director of the telephone lines that have been built there by the American expeditionary forces, according to a cable received just as TELEPHONY was being put to press.

From Factory and Salesroom

Conventions: Wisconsin, Milwaukee, February 13-14

What Is a Duralite Transparent Window Poster?

Those brilliantly-colored, transparent window posters that you've admired on store windows which have attracted a second look because of their high artistic quality—they're Duralite transparent window posters. "Duralite" is a trade name given to a transparency that differs in its construction and finish from any other material seeking to achieve a similar effect. Duralites are imported and sold by the United Service Selling Co., of Cleveland, Ohio.

Duralites, we are told, can be applied to any glass surface—windows, doors, mirrors and almost any smooth surface. It is a very easy matter to affix Duralites, only a little water and a squeegee are needed, and once the Duralite is up, it stays there with a vengeance, according to the manufacturer. Nothing outside of a razor blade and varnish remover will remove it. Wear, weather or water have absolutely no effect either on the colors or on the sign itself. Duralites appeal particularly to the large public service corporations as they afford them an especially suitable and effective form of advertising.

Many of the largest public service corporations, such as telegraph and telephone companies, express companies, and street railway companies use Duralites extensively, and there is nothing, it is said, so eminently suited for the use of telephone companies.

Duralites are claimed to be far cheaper than painted signs and last longer. The colors are transparent or opaque as desired. It is stated that they do not crack, chip or peel off, or get shabby. They save time in affixing and there is little or no wastage, for few Duralites are spoiled. Scenes and trademarks are said to be faithfully reproduced in brilliant colors that do not fade out and never fail to catch the eye of the passer-by.

Duralite transparent window posters are used by many national advertisers.

That's how you may have come to notice this effective "point-of-contact" advertising that says "Here it is!" and continues to say it day-in and day-out, no matter whether it is an advertisement for a trademarked breakfast food on a grocer's window, or your telephone sign on a booth or a store door.

Phoney Bill Comments on "Quality Apparatus" Sales.

"Over the top this year" is Phoney Bill's aim for sales of "Quality apparatus" during 1918, as may be seen in the accompanying reproduction from the January blotter calendar of the Stromberg-Carlson Telephone Mfg. Co. The sales for 1917 and 1916 showed a healthy increase over

"Over the Top This Year."

the preceding years, but Phoney Bill is determined to make an even better showing when the next milestone is passed.

Kellogg Booklet, "Things to Remember."

These paragraphs might appear in the "For Girls Only" column, as they are of special interest to the operator.

The Kellogg Switchboard & Supply Co. has just issued a booklet entitled "Things to Remember" for distribution among telephone operators.

These little booklets should be in the possession of every one whose work is at the switchboard, as they contain valuable information on looks—not facial appearance, but vocal—how you should look to the subscriber.

"Things to Remember" is truly an appropriate title, as the contents indeed contain things to remember. Among the things mentioned are: Answering signals, recording, operator's phrases, testing circuits, signaling, receiving tickets, answering signals from distant stations, passing a "Sent Paid," "Sent Collect," appointment or a messenger ticket and acknowledging tickets. Code symbols and their interpretations, the right and wrong ways to handle cords, which are illustrated, and supervising messages are also included.

All of these subjects are invaluable, to the toll operator especially. They are neatly printed on antique stock and are of a size that will fit very comfortably in the hand bag or vanity case and can edge in with the powder puff, rouge jar or whatever the camouflage may be.

These booklets were made up of extracts from an edition written by Miss Kitty Gang. The Kellogg reprint was edited by W. S. Vivian and is being sent out with the compliments of the Kellogg Switchboard & Supply Co., upon request.

A New Enamel for Retouching Black-Finished Apparatus.

The Stromberg-Carlson Telephone Mfg. Co., of Rochester, is now offering to the trade a new dull black air-drying enamel for retouching worn spots on black finished desk telephones, metal lamp socket strips, key escutcheon plates, etc.

The enamel is put up ready mixed in handy size one-half pint cans, so that it may be easily carried in the inspector's tool bags. The retouching process is very simple as it is only necessary to clean thoroughly the surface to be refinished and to apply the enamel with a small camel's-hair brush. The coating of enamel drys quickly and may be used in subscribers' residences without causing as much interference with service as would be caused by changing the instruments.

Half Pint Can of New Black Enamel.

It is said that many telephone companies are effecting savings in subscribers' station maintenance expenses through the use of this new product.

Paragraphs.

RELIABLE ELECTRIC CO., Chicago, reports gratifying business on its No. 976 self-cleaning substation protectors, with all-over cover and wires entering with holes through the porcelain. This design is equipped with the economical flat fuse which costs less to maintain than other types because it is so easy to renew the fuse wire.

The protector presents an excellent appearance when it is necessary to install protection in a living room. Descriptive literature may be obtained upon request.

JOHN H. HARRISON, traffic engineer of Lima, Ohio, has been employed by the Home Telephone & Telegraph Co. of Fort Wayne, Ind., to make such changes as he may consider necessary to improve the service through the consolidation of the Bell and Home exchanges in that city, approval of which is being sought from the commission.

Record of Telephone Patents

1,248,461. December 4, 1917; filed November 17, 1916. ELECTROMAGNETIC DEVICE; seven claims; G. C. Crawford, East Orange, N. J.; assigned to Western Electric Co. Details of a pole changer are given. A number of electromagnets having flat cores are secured to an insulating base and have a magnetic yoke fastened to one end. An armature is flexibly mounted on the yoke and adapted to vibrate in a direction transverse to the plane of the cores. A number of contact springs is mounted on an armature extension but insulated therefrom. A terminal member having a number of contact points, is mounted on the base, and one of these contact springs is adapted to engage one of the contact points when the armature is moved toward the cores. Another of the contact springs is adapted to engage another of the contact points when the armature is moved away from the cores.

1,248,466. December 4, 1917; filed July 20, 1915. TELEPHONE EXCHANGE SYSTEM; five claims; B. G. Dunham, Hawthorne, N. J.; assigned to Western Electric Co. The feature of this automatic system is the selector switch which has a primary and a secondary movement. A relay is operated by impulses over the incoming line for starting the primary movement of the selector switch, while mechanism controlled by the relay arrests the secondary movement.

1,248,479. December 4, 1917; filed September 7, 1915. AUTOMATIC TELEPHONE EXCHANGE SYSTEM; four claims; C. L. Goodrum, New York; assigned to Western Electric Co. In this system the telephone lines are divided into groups. A series of line finder switches is common to the lines, each of the switches being normally allotted to a group of lines. An auxiliary line finder switch is arranged so as to be temporarily inserted in and removed from the series so as to allot one or two switches for the use of any desired group of lines.

1,248,515. December 4, 1917; filed October 2, 1916. TELEPHONE EXCHANGE SYSTEM; 15 claims; A. E. Lundell, New York; assigned to Western Electric Co. The feature of this semi-automatic system is a pair of traveling switches, pro-

vided with driving circuits which are arranged to be closed alternately. Provision is made to hold open the driving circuit of the farther advanced one of the switches until the second switch arrives in a corresponding position.

1,248,566. December 4, 1917; filed November 8, 1915. ELECTRICAL DEVICE; 11 claims; F. M. Slough, Rochester, N. Y.; assigned to the Stromberg-Carlson Telephone Mfg. Co. The feature of this ringing system for common battery lines is a provision at the central office for increasing the voltage of the source of ringing current and a circuit for connecting this mechanism to the automatic disconnecting means provided for disconnecting the ringing current from a telephone line controlled by the talking set of a subscriber.

1,248,834. December 4, 1917; filed May 17, 1909. AUTOMATIC TRUNKING SYSTEM; 20 claims; E. D. Fales, La Grange, Ill.; assigned to Automatic Electric Co. In this trunking system the line switch is prevented from operating to close a circuit which is associated with it either during a connection or after the connection is released, until the called subscriber hangs up his receiver.

1,248,868. December 4, 1917; filed May 6, 1910. SEMI-AUTOMATIC TELEPHONE EXCHANGE SYSTEM; 30 claims; M. L. Johnson, Chicago; assigned to Automatic Electric Co. Supervisory electromagnetic equipment is provided and automatic means either connect it across the talking circuit of the cord without a battery or with a battery in series.

1,248,979. December 4, 1917; filed February 17, 1917. TELEPHONE EXCHANGE SYSTEM; four claims; F. V. Young, Newark, N. J.; assigned to Western Electric Co. A supervisory relay is provided for each end of the cord circuit and each relay controls a signaling device. A second and a third relay are energized by the actuation of a listening key. A locking circuit for the second relay includes contacts of one supervisory relay and one signaling device. A circuit for the signaling device and an interrupter mechanism including contacts of one supervisory, the second and third relays is completed by the subsequent de-energization of the second relay and the energization of the one supervisory relay.

1,248,998. December 4, 1917; filed July 12, 1916. MICROPHONIC ATTACHMENT FOR TELEPHONE TRANSMITTER; 10 claims; W. C. Bellows, Chicago; assigned to Pelouze Mfg. Co., Chicago. This device consists of an inner, thin hollow cylinder terminating at its rear end in an outwardly tapering member. A similar member is supported within and in spaced relation to the first mentioned member. There is a tubular extension at the forward end of the cylinder and a spring carried diaphragm is interposed in the cylinder between and in alignment with the inner tapering member and the flaring extension.

1,249,032. December 4, 1917; filed June 12, 1912. METHOD OF METERING TELEPHONE TRAFFIC; two claims; E. E. Clement, Washington, D. C This method of metering telephone service in a common battery exchange consists in (1) causing a constant flow of electric current in each of two connected telephone lines in joint use; (2) causing these separate flowing currents to react against each other so as to produce a resultant dynamic effect, co-extensive in duration with the joint current flow; (3) causing a continuous sensible registration co-extensive in duration with the dynamic effect mentioned whereby the duration of the line use may be directly measured; and (4) integrating succeeding dynamic effects in continuous summatic relation whereby the total line use for a given period may be directly measured.

1,249,036. December 4, 1917; filed October 1, 1913. TELEPHONE SYSTEM; 16 claims; H. D. Currier, Chicago; assigned to Kellogg Switchboard & Supply Co. The feature of this system is a double-wound supervisory relay connected to the calling end of the cord circuit which controls a signal. When the calling terminal of the cord circuit is placed against the multiple jack of a telephone line, the relay is energized to transmit a characteristic test tone to the operator's telephone.

1,249,145. December 4, 1917; filed August 2, 1916. MACHINE SWITCHING TELEPHONE EXCHANGE SYSTEM; two claims; A. E. Lundell, New York; assigned to Western Electric Co. In this automatic system a revertibly controlled sender includes a stepping relay which is in a fundamental circuit with a control magnet of a side switch for the selector. This fundamental circuit is closed under control of the revertibly controlled sender. Movement of the selective switch is adapted to operate the stepping relay to cause the sender to measure off the travel of the selector. The fundamental circuit is opened by means controlled by the sender when restored.

1,249,146. December 4, 1917; filed December 2, 1916. TELEPHONE EXCHANGE SYSTEM; 28 claims; A. E. Lundell, New York; assigned to Western Electric Co. A description is given of a system for differently applying ringing current to a line for calling certain parties on a party line.

1,249,154. December 4, 1917; filed September 2, 1916. ELECTRIC SWITCH; eight claims; J. L. McQuarry, Montclair, N. J.; assigned to Western Electric Co. Construction details are given of an automatic switch. A mechanical stop limits the movement of a set of line brushes while means controlled by the condition of a bank of test terminals position the stop to preselect a desired line terminal.

1,249,155. December 4, 1917; filed September 2, 1916; ELECTRIC SWITCH; seven claims; J. L. McQuarry, Montclair, N. J.; assigned to Western Electric Co. In this switch for automatic and semi-automatic systems, the test brushes may be moved to a predetermined position in the test bank. The movement of a test brush controls a common stop means for predetermining the stop position of any one of the line brushes which co-operate with the bank of test terminals.

1,249,159. December 4, 1917; filed March 21, 1908. TWO-WIRE AUTOMATIC TELEPHONE SYSTEM; 79 claims; T. G. Martin, Chicago; assigned to Automatic Electric Co. This system describes a combination of means for extending connection to the called line by using the two sides of the calling line in series. Substation controlled means are provided for ringing another substation on the same line as the calling subscriber, and automatic means for ringing a substation on a line other than the calling line.

1,249,286. December 11, 1917; filed March 12, 1917. TELEPHONE SWITCH MECHANISM FOR PREVENTING CORD TWIST; four claims; H. Hansen, Kansas City, Mo. The switch mechanism is located in the base of the desk stand and is connected to the receiver cord wiring and the cord wiring which extends to the bell box. Each of these cords enter the base of the desk stand through an individual opening.

1,249,429. December 11, 1917; filed February 16, 1916. MULTIPLE LIGHTNING ARRESTER; six claims; W. S. Lewis, Lakewood, Ohio. Several conducting rings are built up in layers and insulated from one another with an arrangement for clamping them to the base. A conducting bar passes through the rings and is also clamped to the base. The outer surface of the conducting bar and the inner surface of the rings form a spark gap. Lugs extend from each ring for attaching a conducting element.

1,249,570. December 11, 1917; filed December 29, 1916; SIGNALING SYSTEM; nine claims; S. S. A. Watkins, Mt. Vernon, N. Y.; assigned to Western Electric Co. The feature of this selective ringing system is the signaling current generator which has a number of magnetic poles of opposite polarity. A pole of one polarity is of different shape than the pole of the opposite polarity. The armature has two similar concentrated windings oppositely wound with respect to the magnetic field between the poles. Either of the windings may be connected to either of the line conductors.

1,249,582. December 11, 1917; filed November 11, 1912. TELEPHONE EXCHANGE SYSTEM; 59 claims. J. L. Wright, Cleveland, Ohio; assigned to J. R. Garfield. In this semi-automatic system the operator's keyboard, upon which are arranged key sets and signals, is remote from the automatic switching mechanism. The key set switches are associated with the automatic switching mechanism and are connected by three-wire trunk circuits to the remote operator's keyboard. Means in one of the trunk circuits are provided for controlling the signal at the operator's key set and the release of the key set switches.

1,249,583. December 11, 1917; filed December 9, 1912. TELEPHONE EXCHANGE SYSTEM; 66 claims; J. L. Wright, Cleveland, Ohio; assigned to J. R. Garfield. The means for directing the action of the automatic switching mechanism of this semi-automatic system include an impulse-sending device. The impulses of this device are sent over a two-wire trunk line connecting the first and second selector switches. During the restoration of the trunk selector switch, the trunk line is rendered busy.

1,249,849. December 11, 1917; filed February 10, 1912. TELEPHONE MOUTHPIECE; six claims Louis Steinberger, Brooklyn, N. Y. This mouthpiece consists of a substantially solid block of material having a number of apertures through it, each of these apertures being tapered so that the outer ends are relatively larger than the inner ends. The attaching part is separately formed and has one end embedded in the material of the body part, surrounding the ends of the apertures collectively.

1,249,962. December 11, 1917; filed May 3, 1915. TELEPHONE APPARATUS; one claim; L. L. Lundgren, Youngstown, Ohio; assigned one-half to P. E. Gordon and one-half to M. D. Paulin. An auxiliary earpiece is described. It consists of an elastic band which fits snugly over the end of the common telephone receiver and carries a disk to which a central earpiece is fastened. A hole extends from the central portion of the disk to its circumference into which a tube is inserted. At the end of this tube is attached an earpiece.

1,250,116. December 11, 1917; filed October 11, 1916. TELEPHONE EXCHANGE SYSTEM; nine claims; C. L. Goodrum,

New York; assigned to Western Electric Co. The feature of this automatic system is the provision of means under the control of the calling party for actuating the restoring mechanism for all of the automatic switches or for actuating the restoring mechanism of the switch connected to the called line and of a number of preceding switches only and for setting up a connection to another called line over the set switches and other switches.

1,250,192. December 18, 1917; filed August 2, 1911. TELEPHONE REPEATING INSTRUMENT; four claims; C. D. Lanning, Boston, Mass.; assigned to O. B. Roberts, Boston, Mass. This repeater consists of an initially magnetized receiving magnet and its circuit connections and a transmitting microphone and its circuit connections. A rigid block armature in the field of the magnet is rigidly and centrally attached to an electrode diaphragm structure of the microphone. An auxiliary vibration controlling member for the diaphragm in the form of a rectilinearly extensible member is disposed along the central axis of vibration of the microphone diaphragm and extended by means of an attachment to an abutment and to the associated armature and vibratory electrode. This auxiliary tension member which opposes the magnetic pull on the armature, has relatively large elastic limits and a low inherent rate of vibration.

1,250,579. December 18, 1917; filed October 6, 1916. MACHINE SWITCHING TELEPHONE SYSTEM; four claims; C. L. Goodrum, New York; assigned to Western Electric Co. In this automatic system, a side switch is provided for the connector and is advanced from the ringing to the talking position by means operated by the response of the called party. The side switch is reset from talking directly to the ringing position by means controlled by the calling party.

1,250,583. December 18, 1917; filed March 9, 1917. SEMI-AUTOMATIC TELEPHONE SYSTEM; eight claims; H. J. Herrink, London, England; assigned to the Relay Automatic Telephone Co., London, England. The feature of this semi-automatic system using two-wire trunks, is a subscriber's meter control relay which is adapted to respond to alternating current only. After a calling line has been extended to an operator's connecting equipment, alternating current may be applied to the control relay to effect registration.

1,250,716. December 18, 1917; filed January 27, 1917. HOLDER FOR TELEPHONE RECEIVERS; two claims; Katherine G. Townsend, New York. This holder consists of a yoke having sheet metal arms which are adapted to extend downwardly over the back and chest of the wearer. A standard is mounted on the yoke having a rod adapted to telescope in it. A U-shaped support is pivoted to the rod for receiving and supporting the telephone receiver. A chain is fastened to one of the arms of the yoke and adapted to be detachably secured to the other.

1,250,804. December 18, 1917; filed June 18, 1917. SELECTIVE SIGNALING SYSTEM; three claims: L. E. Coon, Chatham, N. J.; assigned to Western Electric Co. A selective signaling system is described whereby an audible signal may be operated at all stations on a two-wire circuit simultaneously and in consonance with impulses from an extraneous source.

1,250,885. December 18, 1917; filed March 15, 1915. AUTOMATIC TELEPHONE EXCHANGE SYSTEM; seven claims; C. A. W. Hultman, Stockholm, Sweden. The selective switching apparatus of this system comprises stationary terminals so arranged as to be identified in two-co-ordinate system. A switch member has selective movement in the two principal directions of this co-ordinate system. It may be set from its normal position to either side in one principal direction and also from an intermediate position to either side in the other principal direction.

1,250,921. December 18, 1917; filed July 28, 1914. TELEPHONE APPARATUS; eight claims; H. T. Martin, New York City; assigned to Western Electric Co. A device is described for readily connecting a number of instruments in circuit with the conductors of a cable reel.

14,411 (Reissue, original patent 1,237,998; August 21, 1917). December 18, 1917; filed November 13, 1917. AUTOMATIC TELEPHONE SYSTEM; 67 claims; R. H. Burfeind, Chicago; assigned to Automatic Electric Co. In this system a series of switches associated with a plurality of groups of lines, has means for automatically selecting idle groups, means for making a group busy and for making a group non-busy. One of these means comprises a circuit controlled directly by one of the switches and provision is made for making this switch common to the lines of the group.

1,251,023. December 25, 1917; filed November 28, 1913. AUTOMATIC TELEPHONE SYSTEM; 27 claims; H. E. Hershey, Minneapolis, Minn.; assigned to Automatic Electric Co. The feature of this system is a group of double-wound relays, one of which is provided for each line. One winding of the relays of each group is connected in series, while the other winding of each relay in a group is connected in series with the winding of the corresponding relay in the other group. The relays control mechanism for extending the connection from the telephone lines to an idle one of the trunk lines and are cut off from the line by a cut-off relay.

1,251,098. December 25, 1917; filed March 12, 1917. COMBINATION TELEPHONE ATTACHMENT; five claims; M. C. Pierce, Madison, Wis. This device has a base plate with a central opening adapted to fit over a telephone transmitter. The plate also has its lower corners cut away to facilitate the removal of the receiver. There are advertising panels, or spaces, upon the base plate and also a scratch pad and pencil secured to it.

1,251,208. December 25, 1917; filed September 20, 1916. ALTERNATING CURRENT TELEGRAPH AND TELEPHONE DUPLEX; eight claims; J. P. Ferriter, Jacksonville, Fla.; assigned one-half to T. J. Peters, Peters, Fla. This duplex involves the use of a junction coil having a primary formed of twisted wires helically wound, one end of one wire and the opposite end of the other wire being connected together. An induction coil is located between a source of high frequency current and the connected ends of the junction coil primary. Condenser means are placed between the line wire circuits and one of the wires of the primary while a variable resistance having a grounded terminal and a condenser are placed between the other terminal of the variable resistance and the other wire of the primary. The receiver is connected with the secondary side of the junction coil.

1,251,219. December 25, 1917; filed May 10, 1915. TELEPHONE CALL CHARGE SYSTEM AND APPARATUS; two claims; C. L. Goodrum, New York; assigned to Western Electric Co. This is intended for use in connection with an automatic telephone system. The charging device requires setting by the calling subscriber before a talking connection can be established and is operable by the called subscriber in responding. The calling subscriber has mechanism under his control for restoring the operating mechanism to normal without charging the call if the called party does not answer. Contacts in the line circuit are opened and maintained open when this last-named mechanism is operated long enough to permit the central station apparatus to interrupt the talking circuit.

1,251,350. December 25, 1917; filed May 13, 1912. TELEPHONE SYSTEM; 16 claims; G. Deakin, San Francisco, Cal.; assigned to Kellogg Switchboard & Supply Co. In this semi-automatic system an automatic switch connects the telephone line with one of the operator-controlled link circuits which are responsive to a call over the line. Operator-controlled automatic switches are provided for connecting to the link circuit through terminals of the line and means are provided for transmitting a characteristic signal over the established circuit to the operator's set associated with the link circuit.

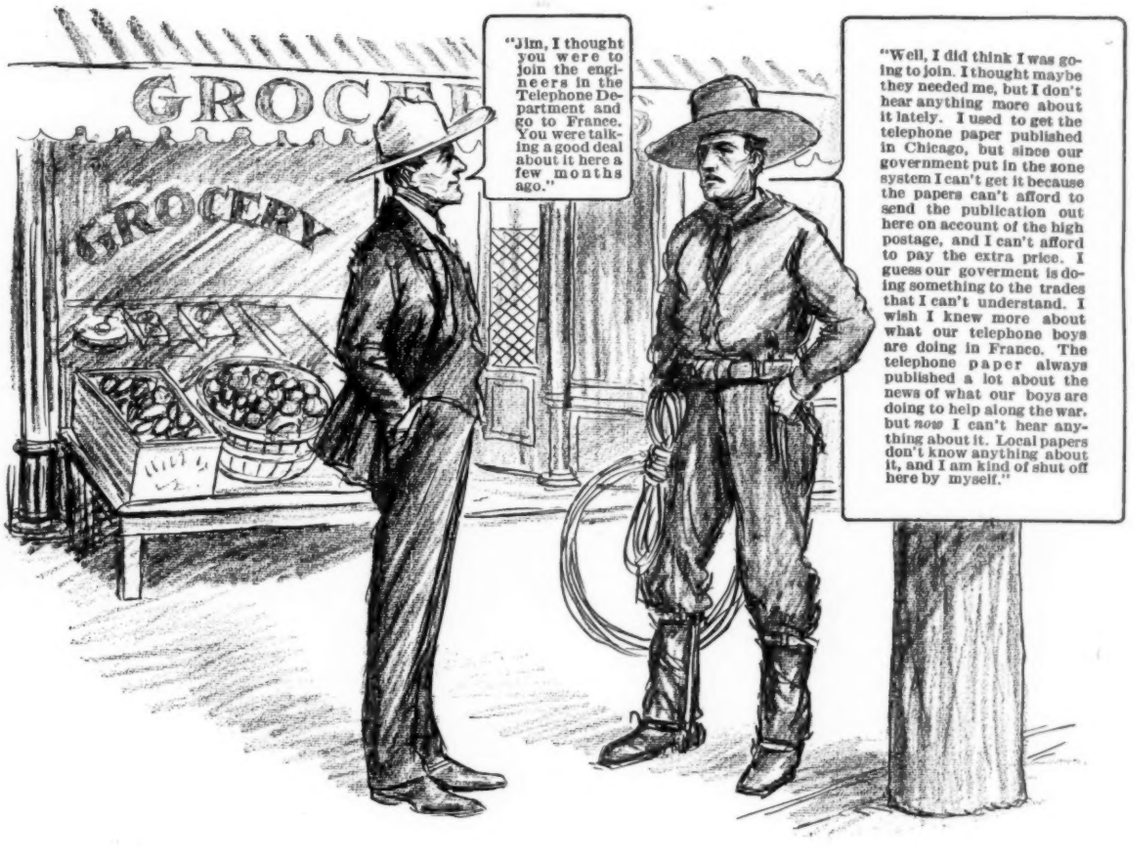
1,251,363. December 25, 1917; filed August 31, 1915. SIGNALING SYSTEM; 17 claims; B. Gherardi, Bayhead, N. J.; assigned to American Telephone & Telegraph Co. A signaling system for use between two offices is described. A signaling path is common to a number of telephone circuits extending between the two offices, and local signaling circuits at each of the offices are individual to each of the telephone circuits. Automatic means operate to connect corresponding local signaling circuits with each other over the common signaling path.

1,251,364. December 25, 1917; filed November 24, 1916. SIGNALING SYSTEM FOR MULTIPLEX TELEPHONE CIRCUITS; 10 claims; B. Gherardi, Bayhead, N. J.; assigned to American Telephone & Telegraph Co. A common trunk is provided over which a number of telephone circuits may be simultaneously extended between two points. There is a common signaling path for these telephone circuits and a local signaling circuit is individual to each of the telephone circuits at each of the offices. Automatic means operate to successively connect corresponding local signaling circuit with each other over the common signaling path.

1,251,475. January 1, 1918; filed December 13, 1916. TELEPHONE EXCHANGE SYSTEM; nine claims; H. P. Clausen, Mt. Vernon, N. Y.; assigned to Western Electric Co. The feature of this automatic system is the provision for making a peg count of traffic conditions of the exchange. A number of recording devices are responsive to the busy condition of the line switches and provision is made for successively and automatically moving them into association with the switches.

1,251,503. January 1, 1913; filed June 21, 1915. TWO-WIRE MULTIPLE AUTOMATIC TELEPHONE SYSTEM; 23 claims; C. L. Goodrum, New York; assigned to Western Electric Co. A test relay and its connection and operation in a two-wire multiple automatic system is described.

1,251,504. January 1, 1918; filed August 23, 1915. MACHINE SWITCHING TELEPHONE EXCHANGE SYSTEM; six claims; C. L. Goodrum, New York; assigned to Western Electric Co. A method of applying ringing current in an automatic system is described. A ringing generator is associated with a connector wherein the telephone lines terminate. A slow-acting relay is in parallel with a stepping magnet which sets the connector on the line and is adapted to connect the generator without the interrupter to the selected line at its armature and front con-


GROCERY
"Jim, I thought you were to join the engineers in the Telephone Department and go to France. You were talking a good deal about it here a few months ago."
"Well, I did think I was going to join. I thought maybe they needed me, but I don't hear anything more about it lately. I used to get the telephone paper published in Chicago, but since our government put in the zone system I can't get it because the papers can't afford to send the publication out here on account of the high postage, and I can't afford to pay the extra price. I guess our goverment is doing something to the trades that I can't understand. I wish I knew more about what our telephone boys are doing in France. The telephone paper always published a lot about the news of what our boys are doing to help along the war, but *now* I can't hear anything about it. Local papers don't know anything about it, and I am kind of shut off here by myself."

Keep 'em Citizens

We're trying to assimilate our emigrants and make useful citizens out of them, but we can't afford to let any of our already good citizens stray by the wayside. We must keep every seeker after knowledge supplied with news and information so that when times come that we need united effort our people will understand the country's requirements and will be ready to respond. To do this our postal facilities should be unhampered and kept free of sectional rates. The "zone system" should be repealed as Senator Smoot proposes in his bill—S2985—so that readers who may be located 2000 or 3000 miles from the large publication centers will not have to pay a postal premium over the reader located but 150 miles away.

Why not call your congressman's attention to this bill and the importance of its repeal? You can do this effectively by tearing out this page and attaching your letterhead and mailing it to him. Will you do it?

Telephony
THE AMERICAN TELEPHONE JOURNAL

tact and at its armature and back contact to connect the generator with the line through the interrupter.

1,251,505. January 1, 1918; filed December 30, 1916. TELEPHONE EXCHANGE SYSTEM; five claims; C. L. Goodrum, New York; assigned to Western Electric Co. The feature of this automatic exchange is the provision for giving a busy signal. When a switch is set on a busy line, a signal of one character is given to the calling party. When another switch is set on the busy line, a signal of another character is given to the calling party initiating the last connection. When the line becomes idle, mechanism is actuated for signaling the first party who called and for connecting the line to his line.

1,251,536. January 1, 1918; filed November 16, 1915. TELEPHONE SYSTEM; 17 claims; C. W. Keckler, Newark, N. J.; assigned to Western Electric Co. A semi-automatic intercommunicating system is described. Manually-operated switching keys are provided for each line circuit and adapted to co-operate with the action of relays on each of the two lines in completing a connection therebetween.

1,251,543. January 1, 1918; filed April 25, 1916. AUTOMATIC TELEPHONE SYSTEM; five claims; J. L. Lattig, Glenside, Pa., and C. L. Goodrum, New York; assigned to Western Electric Co. A method is described of connecting calling lines to the terminals of an engaged subscriber's line but at the same time to keep the conversational circuits of the calling lines to the busy line open when so connected. When the called subscriber's line becomes idle, the conversational circuit of only one of the calling subscriber's lines is automatically completed to the called subscriber's line.

1,251,544. January 1, 1918; filed April 26, 1916. MACHINE SWITCHING TELEPHONE EXCHANGE SYSTEM; four claims; A. E. Lundell, New York; assigned to Western Electric Co. In this automatic system a starter wire is provided for associating an idle finder switch with the telephone lines, a primary movement being given the finder upon the initiation of a call to place it in operative relation to multiples of the calling group. The finder is automatically given a secondary movement to connect with calling line multiples. Upon the termination of the primary movement, the starter wire is extended to the next idle finder.

1,251,545. January 1, 1918; filed November 15, 1916. TELEPHONE SWITCHING SYSTEM; five claims; F. A. Lundquist, New York; assigned to Western Electric Co. The feature of this automatic system is the provision of mechanism controlled by line and cut-off relays associated with each of the telephone lines, for preventing the operation of the switching mechanism of a called line when it is held closed after disconnection of the calling line.

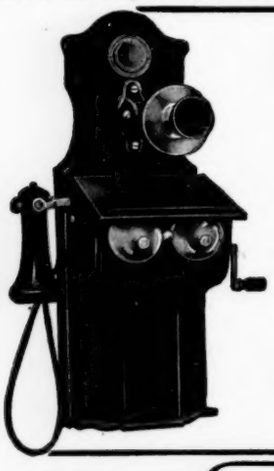
1,251,572. January 1, 1918; filed November 13, 1916. ELECTRICAL PROTECTIVE APPARATUS; five claims; P. S. Price, Rutherford, N. J.; assigned to Western Electric Co. This device consists of a tubular container of insulating material with metal caps enclosing the ends. A fixed electrode is centrally located within the container while a pair of removable electrodes each has a reduced portion and a recess portion. The reduced portions of these electrodes extend through insulated bushings into operative relation with the fixed electrode.

1,251,604. January 1, 1918; filed December 28, 1915. RINGING CONTROL SYSTEM FOR TELEPHONE EXCHANGES; 14 claims; S. B. Williams, Jr., Brooklyn, N. Y.; assigned to Western Electric Co. Ringing control switches are associated with the cord circuits and indicating means common to the cord circuits are selectively responsive to the ringing control switches to indicate which one is operated.

1,251,637. January 1, 1918; filed October 21, 1915. TELEPHONE EXCHANGE SYSTEM; eight claims; W. W. Carpenter, Newark, N. J.; assigned to Western Electric Co. In this semi-automatic system a group of register relays is controlled by manually-operable keys. The register relays control mechanism for initially determining the extent of the counting operation of a counting device, while an additional relay governed by certain of the manually operable devices subsequently modifies the counting operation of the counting device.

1,251,644. January 1, 1918; filed December 29, 1916. TELEPHONE EXCHANGE SYSTEM; 10 claims; H. P. Clausen, Mt. Vernon; assigned to Western Electric Co. Details are given of a metering device for recording calls made in excess of those made at a predetermined rate per unit of time.

1,251,695. January 1, 1918; filed March 31, 1917. CUT-OUT DEVICE FOR TELEPHONE TRANSMITTER; one claim; L. E. Rennels, Albany, Ore. This device is intended for use on desk stands. A movable switch element, located in the standard of the stand, is adapted to engage either of two spaced contacts interposed in the transmitter circuit. The making of one contact renders the transmitter circuit operative while the making of the other cuts the transmitter out of circuit.



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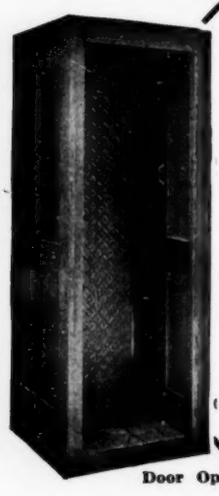

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